FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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Flight.

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EDITORIAL COMMENT.

The War Office Engine Competition.

Taken all round, it may be said that the total of twenty-six entries received by the War Office for next year's aero engine competition is fairly satisfactory. Among the entries we are glad to see the names of most of those British firms whom we may regard as old friends, well-tried in the industry, and whose engines have already scored many notable successes in the air, including such firms as Green, whose success in the Round Britain race is so recent as to scarcely need mentioning; the Wolseley; the E.N.V.; the Isaacson; the A.B.C., for which presumably Armstrong-Whitworth will be responsible, and others. Apart from these, the list includes several of the most notable of British motor manufacturing concerns, though we notice with regret the absence of more than one firm, such as the N.E.C., whom we should have regarded as certain entrants for this really important competition. Of those who have entered there are only three, confining our attention for the moment to purely British firms, who have publicly proved on the track that they are capable of constructing motor car engines which will stand up to full-load stresses for considerable periods of time. These three firms are those of Argyll, Sunbeam, and Vauxhall.

These firms have been more than successful in their efforts to construct an engine of extremely high efficiency for use in car practice, as the records of road and track are there to show. Whether they will achieve the same measure of success when it comes to the building of light, powerful motors for use in aircraft remains to be seen. There is not the slightest reason why they should not be equally successful, and indeed we look forward to seeing these three firms uphold worthily the honour of the British constructor. As a matter of actual fact, we know that one of them, the Sunbeam Co., has succeeded already, as witness the performance of the twelve-cylinder aero-motor fitted in the car on which Chassagne attained such wonderful speeds at the last Brooklands meeting, and what Sunbeams can do we have no hesitation in believing others can achieve.

Apart from these firms who already hold records for public performance, there are others in the list of whom there are the highest hopes. In this connection the prospects of the new Vickers radial engine should be a factor of the very greatest importance, for this and certain other firms which figure in the list, are certainly capable of turning out a motor equal in all-round efficiency and reliability to the best known of the foreign importations. Then, to come to engines which, though made in this country, may be said to have their origin abroad, there are among the entries such well-tried designs as the Austro-Daimler to be manufactured by Messrs. Beardmore in this country, the Gnome, and the Anzani, which may all be looked to to give a good account of themselves. In addition, there are several more whose names are still comparatively unknown, and who must be looked upon as the "dark horses" of the competition. Taken as a whole, therefore, the competition, which has been postponed incidentally from its first announced date in February to the end of April, promises to be productive of more than ordinary interest.

A question which has been asked in connection with this competition and its comparatively lengthy list of entries is that of why, seeing that previous competitions have attracted at most a meagre half-dozen entries, should there be so many for the one which the War Office is organising now? The answer is simple. At last the War Office has set seriously to work to make it comparatively worth while for motor manufacturers to put themselves about in order to enter. No money prize that the War Office is likely to offer would tempt

a large manufacturing firm to devote sufficient time and energy to the production of a single special motor, unless there was the prospect of serious business being forthcoming, supposing the firm concerned to come out top in the competition. But with the solid prospect of orders amounting to at least a value of £40,000, the thing is altogether different and becomes a proposition which merits at least very serious consideration. It simply means that at last the right kind of reward is offered by the War Office—a reward which is very far removed from the peddling attempts to arouse the industry to a sense of the importance of this branch of business which has in the past been characteristic of the methods of the War Office and other Government departments concerned.

It is as we have always said, that the British constructor only needed the right kind of encouragement to lead him out into the field of competition with his foreign rival. If we have lagged behind other nations it was not for the want of the ability to compete in the open field, but simply because the proposition was not a commercial one. While our own Government stood still, those of other countries were coming along with just that sort of encouragement which was needed at the dawn of an infant industry. They, with a perspicacity which was not possessed by our own people, early recognised that aerial navigation was bound to have an enormous effect upon aggressive defence, if we may be allowed to put it in this seemingly paradoxical way, and set out to foster it in such right good earnest that they were enabled to obtain a lead over ourselves which it will require years of persistent and dogged effort to catch up. However, we will not strike the note of pessimism now, when it really appears that both our Government and the industry have become alive to the real importance of the thing.

Reverting to the more technical aspects of the competition as viewed from the list of entries, it would seem that in many ways the actual competition is likely to prove the most interesting and instructive of all the series which have been carried out both at home and in other countries. The main reason for this is that there will be gathered together for test, the one against the other, a greater diversity of types and designs than have ever figured in such an event. We have the rotary type, represented by the Gnome; the fixed-cylinder V type of which the Sunbeam is representative; the non-rotating radial motor, in the shape of the Anzani; the sleeve-valve motor, of which the Argyll design is the embodiment; and the ordinary vertical-cylinder motor familiarised by car practice. It would be strange if out of the testing of so many types of so varied a character there did not emerge much in the way of data useful to engine constructors, and the builders of aircraft alike, quite apart from the mass of information that will be secured for the service of the State. In conclusion, while we should much have liked to have seen the names of such successful firms of engine constructors as Clement-Talbot, Austin, Rolls-Royce, Napier and Crossley, to mention but a few of the houses we know to be capable of turning out a highly efficient motor, figuring in the list of entries, we cannot but regard the response to the invitation of the War Office as being highly satisfactory. We hope and believe that this marks a radical change in the methods hitherto in vogue in the treatment of the British aviation industry.

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Electro-Optical Aviation.

We publish a remarkable article by Mr. Coanda, the well-known designer of the Bristol monoplanes, in which he seeks to attribute many of the sudden disturbances to which aircraft are liable in flight to phenomena that he describes under the term of "Electro-optics."

In general, the line of argument seems to be that the production of assymetry by means of energy results in the movement of mass. That the atmosphere, partly owing to the influence of solar rays, to running water, to subterranean deposits, and the like, is the seat of an electric potential distribution, and that owing to the movements of clouds, to changes from light to darkness, to ozone, and to other factors attracting light rays, this distribution continually changes. Any one of these distributions of potential corresponds to a state of assymetry, and implies, therefore, a mass displacement. When the distribution is changed by the presence of clouds, ozone, the greater or lesser thickness of the atmosphere in the line of the sun's rays, and the like, the distribution of potential changes, a fresh assymetry is set up, and there results a mass flow, which we presume we may interpret as wind, although the word hardly occurs in Mr. Coanda's text. Furthermore, the aircraft, owing to its motion through the air, becomes a sensitive electroscope, and is, therefore, itself deflected by electrostatic charges on clouds and the like, and by magnetic fields.

It is not clear to us whether Mr. Coanda is in the main seeking to establish the cause of winds in his electro-optical phenomena, or whether he regards it as the direct agent for the physical disturbance of the machine. Apparently it is the latter, and if we are correct in this assumption we can only say that the conclusion surprises us, because we should have thought that electric potential of the magnitude required to effect the reactions capable of producing the accelerations to which aircraft are now and again subjected in flight would have been far more likely to have spent itself in a flash of lightning. Alternatively, when we come to consider the situation presented by a modern aeroplane entering a magnetic field of the implied intensity, we should have expected that the first effect would have been the sudden arrest of the rotary Gnome engine, or, granting it an unusual persistency of operation, its subsequent reduction to the molten state.

Unfortunately, the onus of the English version of Mr. Coanda's contribution rests on our shoulders, owing to the original having been submitted in French. In the translation of documents of this character it is not always certain that one correctly interprets the writer's meaning in the new language, and so for any failings upon our part in this matter we can only tender our apologies in advance, to the author and to our readers alike.

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London to Brighton Race.

FOR Saturday next the directors of the London Aerodrome, Hendon, in conjunction with the Sussex Motor Yacht Club, have arranged a handicap race from Hendon to Brighton and back. The competitors will start from Hendon at 11 a.m., and after passing over Brighton Palace Pier, the finishing mark of the first stage of the race, will land at the aerodrome at Shoreham. The airmen will start from Brighton on the second and final stage at about 2.30 p.m., the winners being expected to arrive at the finishing point at the Hendon Aerodrome shortly after 3.30 p.m.

For the winner of the handicap, the Sussex Motor Yacht Club, of which Mr. Harry Preston is vice-commodore, is presenting a valuable trophy and £100, first prize, and £25 second prize, and Mr. Barclay Walker is presenting a trophy and £50 first prize, and £25 second prize, to the pilots who complete the course in the fastest time.

MEN OF MOMENT IN THE WORLD OF FLIGHT.

MONS. PIERRE VERRIER—The popular Maurice Farman pilot.

PIERRE VERRIER.

PILOT.

ONE of the most popular pilots at Hendon, and recognised as a past master of the Maurice Farman biplane is Pierre Verrier. Previous to his coming to England in the middle of last year, his flying had not brought him prominently into the public eye. As a matter of fact he qualified for his pilot's certificate on a Voisin biplane at Juvisy at the end of 1910, but it was not until the following February that he actually got his ticket. It is numbered 390—a multiple of 13, but Verrier is not superstitious—and it is one of a batch of 49 which were issued by the Aero Club of France at its monthly meeting on Feb. 3rd, the names of the other pilots including John Weston, Gustav Hamel, Rene Hanriot, Andre Debuissy, Prince de Nissolles, Maurice Chevillard, Pierre Gougenheim, Georges Boillot, and Jules Goux, the last two of whom did not continue in aviation, but returned to motor car racing.

Early in 1911 he joined the Maurice Farman school and did a good deal of piloting of the ordinary type. He demonstrated his qualities as a cross-country flyer when, in January of last year, he flew one of the Maurice Farmans, which had taken part in the French military aeroplane trials, from Rheims to Buc. Upon the Aircraft Manufacturing Co. taking over the control of the Farman machines for Great Britain, he was engaged by them and made his first public appearance at Hendon on June 1st, 1912. Regular visitors to the popular London aerodrome will remember that his *debut* was a notable one, his steep climbs and very long glides creating quite a sensation, while the way in which he varied the speed of the machine by throttling the engine, was a revelation. Verrier took part in the speed handicap on this occasion, and had an easy win, albeit he lost a little time through touching No. 6 pylon; he noticed the fault, and banking the machine steeply, made a complete circuit of the pylon.

Verrier is a good cross-country flier, and frequently flies from Hendon to Farnborough with machines purchased by the Government; in fact, he often makes this journey twice a week. On the occasion of Mr. C. Grahame-White's wedding he flew over to Chelmsford, and gave a fine display on the Maurice Farman for the entertainment of the guests assembled for the wedding. Lately he has done some flying on the Henry Farman machine, and it will be remembered that his mount in the Aerial Derby was of this type. Verrier is very popular with passengers and never lacks a companion when he makes an ascent. This is perhaps the greatest compliment which one could pay to his careful flying.

"THE HAWK."

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OUR FULL PAGE PORTRAITS.

IN response to many requests, we publish below a list in alphabetical order for each year, with the dates of appearance, of the full-page portraits which have appeared in FLIGHT of Pioneers, Pilot-Constructors, Pilots, &c.

Nearly all these copies are still obtainable from the Publishers, 44, St. Martin's Lane, London, W.C., at 6½*d.* each, post free, for those published during 1909, 1910, 1911 and 1912. For the current year (1913) the charge is 3½*d.*, post free. These portraits form a unique collection of prominent men in the World of Flight.

FLIGHT PIONEERS.

Name.	Date Published.
1909.	
CODY, S. F.	Sept. 18
MCCLEAN, Frank	Dec. 18
MOORE BRABAZON, J. T. C.	Nov. 6
ROLLS, Hon. C. S.	Nov. 13
1910.	
BARNES, G. A.	Sept. 24
BOYLE, Hon. Alan	July 23
CLEMENT, A.	Oct. 22
COLMORE, G. C.	Dec. 10
DICKSON, Capt. Bertram	July 16
DREXEL, J. Armstrong	July 30
DUNNE, J. W.	Sept. 3
FARMAN, Henry	Feb. 12
GIBBS, Lancelot D.	Aug. 13
GILMOUR, D. Graham	Oct. 29
GRACE, Cecil	July 9
GRAHAME-WHITE, C.	April 30
LADOUGNE, Emile	Oct. 15
LORAINE, Robert	Sept. 17
MCARDLE, W. E.	Nov. 26
MAXIM, Sir Hiram S.	Mar. 12
MOISANT, John B.	Aug. 27
OGILVIE, Alec	Sept. 10
PAULHAN, Louis	Jan. 22
RADLEY, James	Aug. 20
ROE, A. V.	Jan. 29
SINGER, Mortimer	Jan. 15
SOPWITH, T. O. M.	Dec. 3
1911.	
ASTLEY, H. J. D.	Mar. 25
BARRINGTON-KENNETT, Lt. B. H.	Sept. 16
BLONDEAU, G.	Sept. 23
CONNEAU, Lieut. ("Beaumont")	July 15
CONNER, Lieut. D. G.	Mar. 4
DUCROCQ, Maurice	April 29
FULTON, Capt. J. D. B., R.F.A.	Dec. 23
GRESWELL, C. H.	Feb. 25
HAMEL, Gustav	April 1
HEWLETT, Mrs. Maurice	Aug. 26
MOORHOUSE, W. B. R.	Oct. 14
MORISON, O. C.	Jan. 21
PIXTON, C. H.	May 6
PORTE, Lieut. J. C., R.N.	Dec. 9
PRIER, Pierre	April 22
SAMSON, Lieut. C. R., R.N.	Oct. 7
SANTONI, D. Lawrence	Dec. 9
STOCKS, Mrs. C. de Beauvoir	Nov. 18
VALENTINE, James	June 24
WATKINS, Lieut. H. E.	Feb. 4
WEYMANN, C. T.	July 8
WOOD, Capt. H. F.	Feb. 18
1912.	
HERVEU, Mdme. Jane	Jan. 6
HEWITT, Vivian	May 4
LONGMORE, Lieut. A. M., R.N.	April 20
SALMET, Henri	Mar. 16

MEN OF MOMENT IN THE WORLD OF FLIGHT.

1911.	
NORTHCLIFFE, Lord	Aug. 5
1912.	
ARBUTHNOT, Maj.-Gen. H. T., C.B.	Nov. 23
GLAZEBROOK, Dr. R. T., C.B.	Nov. 16
HENDERSON, Brig.-Gen. D. C. B.	Nov. 9
HOLDEN, Col. H. C. L., C.B.	Nov. 2
NORTHCLIFFE, Lord	Nov. 30
O'GORMAN, Mervyn, C.B.	Dec. 28
PAINE, Capt. G. M., M.V.O., R.N.	Dec. 14
ROSE, the late Sir Charles D.	Oct. 19
RUCK, Maj.-Gen. R. M., C.B., R.E.	Oct. 26
SYKES, Maj. F. H.	Dec. 21
WHITE, Sir George, Bart., LL.D.	Dec. 7
1913.	
BLACKBURN, R.	May 17
BLÉRIOT, Louis	Oct. 4
BLONDEAU, Gustave	June 7
COANDA, M.	May 24
CODY, S. F.	Feb. 1
DUNNE, J. W.	Feb. 15
DYOTT, G. M.	June 14
ENGLAND, E. C. Gordon	April 19
EWEN, W. H.	May 10
FLANDERS, L. Howard	Mar. 29
FOWLER, F. B.	Oct. 11
GATES, Richard T.	Sept. 20
GRAHAME-WHITE, Claude	Jan. 18
GREEN, G.	Sept. 13
HAMEL, Gustav	June 21
HAVILLAND, G. de	Feb. 22
HAWKER, H. G.	July 12
HEWLETT, Mrs. Hilda B.	June 7
HUCKS, B. C.	June 28
KOOLHOVEN, S. F. W.	May 31
LANCHESTER, F. W., M.I.C.E.	Jan. 4
MCCLEAN, Frank K.	Mar. 15
MANNING, W. O.	Mar. 22
MANTON, Marcus D.	Oct. 18
MAY, Fred	Sept. 13
MERRIAM, F. Warren	July 19
PAGE, F. Handley	Mar. 1
PATERSON, Compton C.	Aug. 23
PÉGOUD, E.	Oct. 4
PERRIN, Harold E.	Jan. 11
PICKLES, Sydney	Aug. 2
PIXTON, C. Howard	July 5
PIZEY, Collyns P.	July 26
PORTE, Lieut. J. C.	May 3
RADLEY, J.	April 12
RAYNHAM, F. P.	Sept. 27
ROE, A. V.	Jan. 25
SANTONI, D. Lawrence	April 26
SIPPE, Sidney V.	Aug. 30
SLACK, Robert B.	Aug. 16
SOPWITH, T. O. M.	Feb. 8
SPRATT, Norman	Oct. 25
THOMAS, G. Holt	Mar. 8
TURNER, Lewis W. F.	Aug. 9
WRIGHT, Howard T.	April 5

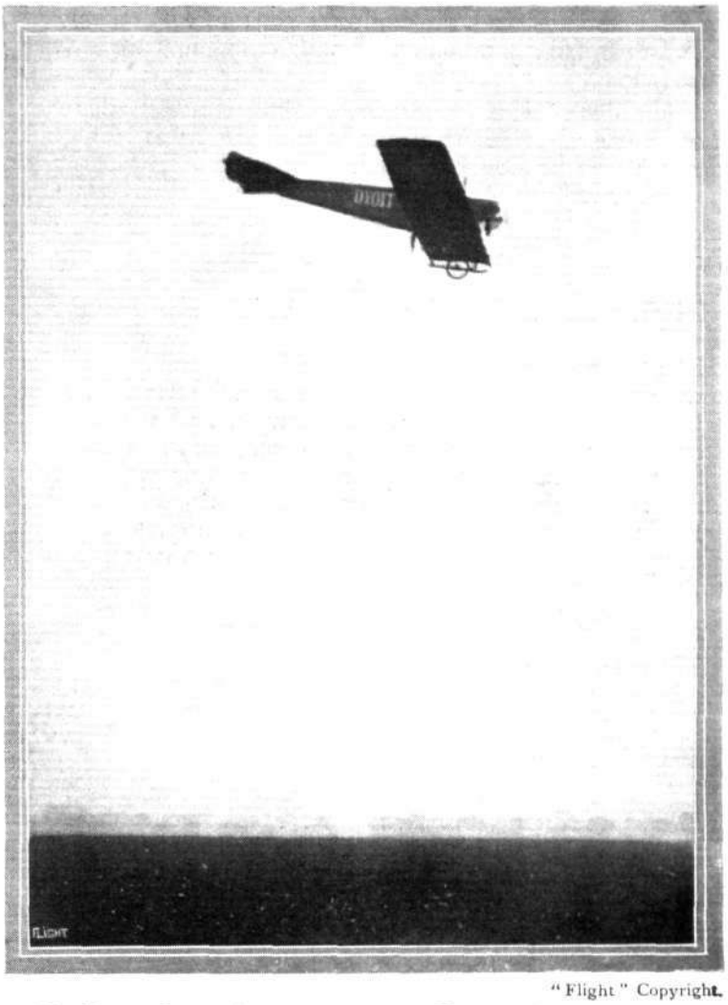
FLIGHT

THE DYOTT MONOPLANE AT HENDON.

AFTER an extensive tour of the U.S.A., where he has given numerous exhibition flights, Mr. G. M. Dyott has brought his machine back to this country, and it is now flying at Hendon. When looking at this machine it is difficult to believe that it has just completed a series of exhibition flights, most of them made under anything but ideal conditions, so well has it kept its ship-shape appearance. Not only has it flown one 2,000 miles, but on two occasions the machine was turned upside down when landing without breaking anything of importance, thus testifying to the qualities of the design and the workmanship.

With the exception of one or two details the machine is not altered since its completion in April this year, on which occasion it will be remembered it was fully described in the columns of FLIGHT. One of the alterations is to the tail skid, which has been replaced by one of cane instead of the long wooden skid with which it was fitted when Mr. Dyott took the machine out to America. Another alteration has been made to the mounting of the transverse steel tube which connects the two skids of the chassis. Instead of securing this tube to the lower extremity of the strut, which method involved a special socket, it is now fitted in a plain socket on the skid and working in compression only, the tension being taken by two stranded cables running parallel with the tube. Should the tube become damaged it can, if necessary, be replaced with a piece of gas pipe, as the socket can be made of the simplest form. The machine is particularly well equipped with all the usual instruments for cross-country work, and is in addition fitted with an instrument for recording the movements of the control levers by means of three pencils which are connected to the warp, rudder and elevator respectively.

We hope shortly to be able to publish a description of this recorder together with some graphs specially prepared for FLIGHT by Mr. Dyott.



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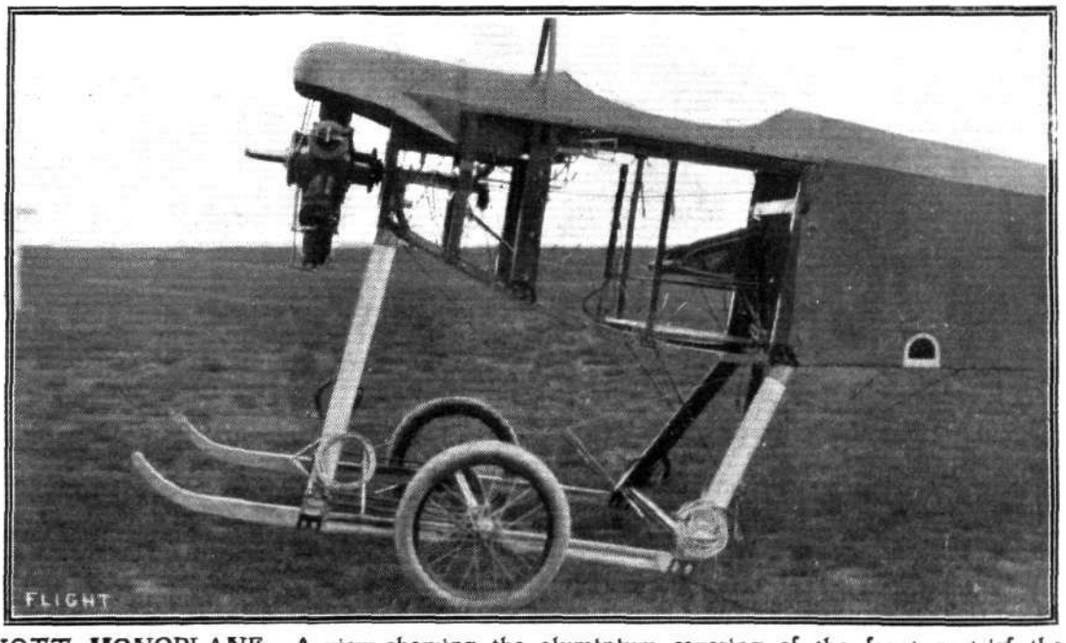
Mr. Dyott flying his monoplane at Hendon Aerodrome on Saturday last.

From what we have seen of it the machine appears to fulfil admirably the conditions for which it



THE DYOTT MONOPLANE.—A view showing the aluminium covering of the front part lof the *fuselage* removed, allowing a thorough inspection of engine and controls.

was designed. It has light weight combined with strength, it can be easily dismantled and erected, it has a good climbing speed, on landing it pulls up very quickly and it can land in a small field, as the minimum speed is fairly low.

The upper and lower pylons can be removed by undoing a few wire strainers, and similarly that is all that is necessary to dismantle the chassis, since the struts are a sliding fit in their sockets, and can be pulled out when the diagonal cross wires have been removed by undoing the turnbuckles. The accompanying photograph shows the aluminium covering on the front part of the *fuselage* removed, an operation which only takes about a minute, and which allows the closest inspection of the engine and controls.

The maximum speed of the machine is about 65 m.p.h., while it can be landed at a speed of about 45 m.p.h. The tanks contain enough fuel for a three hours flight with the 50 h.p. Gnome engine with which it is fitted.

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NAVAL AND MILITARY AEROPLANE COMPETITION, 1914.

FROM the War Office we are notified that, owing to the large number of entries for the forthcoming Naval and Military Aeroplane Engine Competition, and the scale upon which it has accordingly been necessary to arrange for the erection of the requisite engine testing plant, it has been decided to postpone the competition from 1st February to 30th April, 1914. Engines entered for the competition must be delivered at the Royal Aircraft Factory on or before 14th April, 1914.

Entrants for the competition are as follow :—

Messrs. Argylls, Ltd., Alexandria, Dumbartonshire.
Messrs. Sir W. G. Armstrong, Whitworth and Co., Ltd., Elswick Works, Newcastle-on-Tyne.
The Beardmore Austro-Daimler Aero Engine, Ltd., 36, Victoria Street, London, S.W.
The British Anzani Engine Co., Ltd., 30, Regent Street, London, W.
The British Rotary Motor (Aviation) Co., Ltd., Lynchford Road, South Farnborough.
The B. and D. Syndicate, Ltd., Star Life Buildings, St. Augustine's Parade, Bristol.
The Centrum Syndicate, Ltd., 31 and 33, High Holborn, London, W.C.
The C.E. Syndicate, Ltd., 6, Parliament Street, Hull.
Messrs. Crew and Partness, Ltd., 118, 120, 122, Victoria Street, London, S.W.
The Dudbridge Iron Works, Ltd., Stroud, Gloucestershire.
The E.N.V. Motor Co., 4, Hythe Road, Willesden, London, N.W.
The Gnome Engine Co., 47, Victoria Street, London, S.W.
The Green Engine Co., Ltd., 166, Piccadilly, London, W.
Messrs. Grossman and Florence, 21, Ranelagh Road, Westbourne Square, Paddington, W.
Messrs. Hardy and Padmore, Ltd., Worcester Foundry, Worcester.
The Hart Engine Co., Hunslet, Leeds.
Mr. John Hutcheon, "Taendrum," Furness Vale, Cheshire.
The Isaacson Radio Engine Co., Ltd., Boyne Engine Works, Hunslet, Leeds.
Lavoie Motor Ltd., Montreal, Province of Quebec, Canada.
Messrs. Nesfield and Mackenzie, Ltd., 274, Uxbridge Road, West Ealing, London, W.
Messrs. Saville and Walton, Electrical Engineers, &c., Rosebery House, Bream's Buildings, Chancery Lane, London, W.C.
The Sunbeam Motor Car Co., Ltd., Moorfield Works, Wolverhampton.
Vauxhall Motors Ltd., Luton, Bedfordshire.
Messrs. Vickers Ltd., Vickers House, Broadway, Westminster.
Messrs. White and Poppe, Ltd., Motor Engineers, Lockhurst Lane, Coventry.
The Wolseley Tool and Motor Car Co., Ltd., Adderley Park, Birmingham.

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OBSERVING TROOPS FROM AEROPLANES.

IN our last issue we briefly referred to the notes issued by the War Office to guide officers in charge of troops whose movements are being observed from aircraft. Pilots are instructed to fly as a rule not less than 3,000 feet when exposed to rifle fire, and when artillery is underneath them this altitude must be increased by another thousand feet. Under misty conditions it is left to the pilot to drop lower if objects cannot be distinctly seen. As a rule observers in aircraft are best able to judge whether they are under fire or not.

The General Staff notes are as follows :—

(i) The accurate observation of bodies of troops largely depends on two circumstances: (a) The background, that is, the colour of the ground on which the troops may be at the moment; and (b) Movement, *i.e.*, troops on the move are far more easily seen than when they remain absolutely still.

(ii) A column of troops moving along a white or light-coloured road can be easily seen from almost any height, whilst an extended line of infantry scattered on the grass amongst small bushes will seldom be detected if they remain still. Troops should on no account look up at aircraft, for nothing is more conspicuous than men's faces.

(iii) When troops are marching along a broad road it is advisable that strict march discipline be maintained, the troops being kept well to one side of the road, so that the remaining side, if kept absolutely clear, will look like the whole of the road, and will probably not attract the observers' attention.

(iv) Troops in column of route on a narrow road may escape observation if they at once take cover on either side of the road, and remain absolutely still, close under the hedges.

(v) Woods, belts of trees, high hedgerows, and villages all offer complete shelter from observation if taken advantage of when the aircraft is still at a distance.

(vi) When moving over country in extended order or in small columns, troops should take cover under the nearest trees, hedgerows, or patches of gorse and bushes, lying still, close under the edge of such vegetation until the aeroplane has passed on.

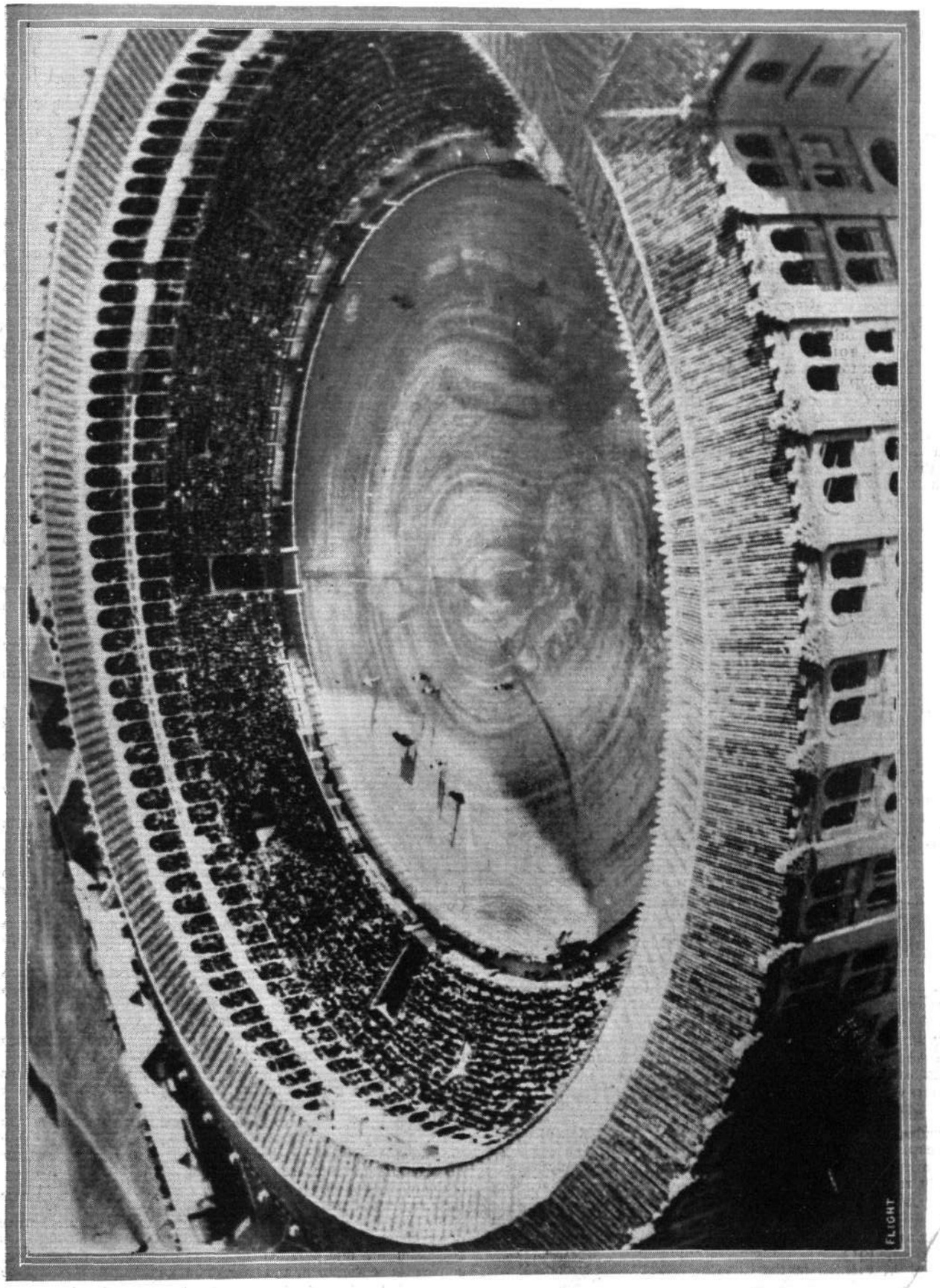
(vii) Formed bodies of infantry must be got under trees or into woods if they are to escape observation, for in the open they are certain to be seen.

(viii) Artillery will probably be unable to conceal either their guns or their horses, except in very favourable country where trees are numerous and the view much restricted. Guns in the open will no doubt be easily seen, and the only hope of concealment is to occupy a position close up to a hedgerow and fire through it.

(ix) When troops are in camp, or in bivouac, every endeavour should be made to alter the usual formations with a view to deceiving the observer, and causing him to mistake one unit for another, *e.g.*, a battery for a Field Company, R.E. Guns can be covered with tarpaulin or hay. Where feasible, cooking should be done near villages, so that the smoke does not attract attention.

(x) The question will often arise as to how long the presence of a hostile aeroplane is to be permitted to interfere with or paralyse the manoeuvre which may be in progress. Time may be a more important factor than discovery, and brigade commanders must judge whether it is more advisable to delay the movement by taking cover and remaining hidden, or to continue the manoeuvre.

In recent training, both the 3rd and 4th Divisions succeeded in escaping observation, and some of the Cavalry were also able to remain undetected. The concealing of troops from aircraft observation having been successfully demonstrated, the above rules are interesting as embodying the conditions under which commanders succeeded in avoiding the notice of aircraft when moving considerable bodies.



UNIQUE PHOTOGRAPH FROM AN AEROPLANE.—A bull-fight in progress at the Plaza de Toros, Madrid, which gives accommodation for an audience of 40,000.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held here on Tuesday, the 28th October, 1913, when there were present:—Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Prof. A. K. Huntington, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, C.B., Mr. C. F. Pollock, Mr. A. Mortimer Singer, Mr. T. O. M. Sopwith, and the Secretary.

New Members.—The following new Members were elected:—I. F. Fairbairn-Crawford, V. W. P. Massy, 2nd Lieut. R. O. Paterson, E. W. Reed, Lieut. M. A. H. Scott, R.E., and Mrs. Mortimer Singer.

Aviators' Certificates.—The following Aviators' Certificates were granted:—

650 Willy Voigt (Bristol Biplane, Bristol School, Salisbury Plain). Oct. 15th, 1913.
(Subject to permission of Aero Club of Germany.)

651 Lieut. Eric Roper-Curzon Nanson, R.N.R. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 15th, 1913.

652 Capt. Herbert Creagh Jenings (5th Royal Irish Lancers) (Caudron Biplane, Ewen School, Hendon). Oct. 16th, 1913.

653 Capt. Thomas Couper Mudie (Royal Scots) (Bristol Biplane, Bristol School, Brooklands). Oct. 16th, 1913.

654 Eng.-Lieut. Charles Dempster Breese, R.N. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 16th, 1913.

655 Leonard Cameron Kidd (Grahame-White Biplane, Grahame-White School, Hendon). Oct. 22nd, 1913.

656 Assistant-Paymaster Vyvian Harcourt Coles, R.N.R. (Vickers Biplane, Vickers School, Brooklands). Oct. 22nd, 1913.

657 Capt. Gerald Charles Balfour Buckland (8th Gurkha Rifles, I.A.) (Bristol Biplane, Bristol School, Salisbury Plain). Oct. 22nd, 1913.

658 James William Humphrys Scotland (Caudron Biplane, Hall School, Hendon). Oct. 23rd, 1913.

659 Major Gerald Kinsman, R.F.A. (Vickers Biplane, Vickers School, Brooklands). Oct. 24th, 1913.

660 Reginald Kirshaw Pierson, B.Sc. (Vickers Biplane, Vickers School, Brooklands). Oct. 24th, 1913.

661 Maurice Bernal Blake (Grahame-White Biplane, Grahame-White School, Hendon). Oct. 24th, 1913.

662 Lieut. Alexander Gallaher (4th Dragoon Guards) (Bristol Biplane, Bristol School, Salisbury Plain). Oct. 24th, 1913.

663 Lieut. Keith Frederick William Dunn, R.F.A. (Bristol Biplane, Bristol School, Salisbury Plain). Oct. 24th, 1913.

664 Lieut. Charles Herbert Oxlade, R.N.R. (E.A.C. Biplane, Eastbourne School, Eastbourne). Oct. 25th, 1913.

665 Capt. Charles George Billing, R.N. (Caudron Biplane, Ewen School, Hendon). Oct. 27th, 1913.

The following certificates were taken in France:—

Guy Cruikshank.
James Welby Madeley.
Robin Grey.

Accidents Investigation Committee.—On the motion of Col. H. C. L. Holden, the report on the fatal accident to Major George Charleton Merrick was unanimously adopted.

(Full report will be found following these notices.)

***Daily Mail* £5,000 Prize, 1914.**—The preliminary announcement of the Regulations drawn up by the Competitions Committee was considered and approved, and ordered to be submitted to the Proprietors of the *Daily Mail*.

New Premises.

A circular was issued October 15th, 1913, asking Members to give an expression of opinion on the subject of the Club acquiring new premises. Will those Members who have not already done so, kindly reply to the two questions set out in the circular, as early as possible?

Competitions Committee.

A meeting of the Competitions Committee was held on Tuesday October 28th, 1913, when there were present: Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. F. P. Armstrong, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Mr. J. T. C. Moore-Brabazon, Mr. Mervyn O'Gorman, C.B., and the Secretary.

***Daily Mail* £5,000 Prize, 1914.**—The preliminary regulations were drafted, and ordered to be submitted to the Executive Committee.

Certified Trials.—It was decided to issue certificates of the certified trials in the following cases:—

Societe Astra, for the performance of the "Astra Torres" dirigible on September 15th, 1913, when a speed of 51·1 m.p.h. was attained.

Grahame-White Aviation Co., Ltd., for the performance of the Grahame-White Biplane carrying pilot and nine passengers for 19 mins. 47 secs.

Aviators' Certificates.

The tests now in force for Aviators' Certificates will be altered as from January 1st, 1914. The altitude test will be increased to 100 metres (328 ft.), and a glide from that height must be made with the engine stopped. The new regulations will be issued in due course.

British Empire Michelin Competition No. 2 £800.

The Michelin Tyre Co. have notified the Royal Aero Club that they will be pleased to extend the date for the Competition for the £800 Prize to November 30th, 1913. This refers to the Cross-Country Competition, which closed on October 15th.

The rules are as under:—

THE BRITISH EMPIRE MICHELIN CUP NO. 2 £800.
(*Under the Competition Rules of the Royal Aero Club.*)

The Michelin Tyre Company has presented to the Royal Aero Club of the United Kingdom for competition by British aviators the sum of £800, to which will be added a trophy to be retained by the winner.

The following are the rules governing the competition for the year 1913:—

1. The winner for the year 1913 shall be the competitor who, on November 30th, 1913, shall have completed a prescribed circuit of about 279 miles on an aeroplane in flight in the fastest time, reckoned in miles per hour.

2. Competitors may select their own circuit of about 279 miles, but the start must be made from a flying ground approved by the Royal Aero Club, and the proposed circuit must be submitted to the Royal Aero Club before the flight is made.

The complete circuit must be accomplished without alighting.

3 The flight must be observed at each point named in the circuit by officials appointed by the Royal Aero Club.

4. A number must be prominently displayed on the aeroplane in places approved by the officials, and when flying round each of the points selected in the circuit, the aviator must fly sufficiently low so that his number may be easily verified by the official observer.

5. The circuit must be completed between the hours of sunrise and sunset, on any one day.

6. The entrant, who must be the person operating the machine, must be a British subject, flying on a British-made aeroplane, must hold an Aviator's Certificate, and must be duly entered on the Competitor's Register of the Royal Aero Club.

7. The complete machine, and all its parts, must have been entirely constructed within the confines of the British Empire, but this provision shall not be held to apply to raw material.

8. An entrance fee of £1 must accompany every notification of an attempt, and at least three clear days' notice must be given to the Secretary, Royal Aero Club, 166, Piccadilly, London, W. A competitor must further deposit a sum of £10 on account of expenses, if any, of observers. Any balance not so expended will be returned to the competitor.

9. Should any questions arise at any time after the date of entry as to whether a competitor has properly fulfilled the above conditions, or should any other question arise in relation to them, the decision of the Royal Aero Club shall be final and without appeal.

10. A competitor by entering waives any right of action against the Royal Aero Club or the Michelin Tyre Co. for any damages sustained by him in consequence of any act or omission on the part of the officials of the Royal Aero Club or the Michelin Tyre Co., or their representatives or servants, or any fellow competitor.

11. The aeroplane shall at all times be at the risk in all respects of the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself or his aeroplane, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and the Michelin Tyre Co. in respect thereof.

12. The Royal Aero Club reserves to itself the right to add to, amend, or omit any of these rules should it think fit.

166, Piccadilly, W. HAROLD E. PERRIN, Secretary.

ACCIDENTS INVESTIGATION COMMITTEE OF THE ROYAL AERO CLUB.

REPORT No. 18.

REPORT ON THE FATAL ACCIDENT TO MAJOR GEORGE CHARLETON MERRICK, WHEN FLYING AT THE CENTRAL FLYING SCHOOL, UPAVON, ON FRIDAY, OCTOBER 3RD, 1913, AT ABOUT 11.45 A.M.

Brief Description of the Accident.—Major George Charleton Merrick was flying a Short Biplane, fitted with a 70 h.p. Gnome Engine, at the Central Flying School, Upavon, on Friday, October 3rd, 1913, at about 11.45 a.m. He was coming down apparently with the object of alighting at the sheds. When at a height of about 300 ft. he was observed to be descending at a very steep angle. Shortly after this, he fell out and was killed.

Major Merrick was granted his Aviator's Certificate, No. 484, on *May 17th, 1913*, by the Royal Aero Club.

Report.—The Committee sat on Monday, October 13th, 1913, and received the report of the Club's representatives who were on the spot within a short time of the occurrence, together with the evidence of eye-witnesses. Mr. Horace Short of Messrs. Short Bros., attended and produced plans of the aircraft, and gave evidence on various points raised by the committee.

From the consideration of the evidence, the Committee regards the following facts as clearly established :—

1. The aircraft was built by Messrs. Short Bros., at Eastchurch in March, 1913.

2. There was practically no wind at the time of the accident.

3. After the pilot fell out the aircraft turned on its back, and then landed upside down. The condition of the aircraft showed that it landed very gently.

4. When examined after the accident all the controls were found to be in order.

5. The pilot had made at least eight short flights on this particular aircraft, one of them lasting about fifteen minutes, earlier on the day of the accident.

6. The pilot was not strapped in.

Opinion.—The Committee is of opinion that the accident was due primarily to the pilot forcing the aircraft down at too steep an angle, resulting in his falling forward on his control and accentuating the steepness of the descent.

Recommendation.—The committee recommends that attention be directed to the great dangers involved in a steep descent when undertaken by a comparatively inexperienced pilot. An aircraft, when carrying out a steep *vol plané* descent, is very much more sensitive to external influences than when descending at its natural gliding angle.

The Committee also draws attention to the fact that the pilot was not strapped in. It is quite possible that, in this particular instance, had he been so, the accident might have been averted.

Royal Aero Club, 166, Piccadilly, London, W.

October 28th, 1913.

PEGOUD'S FEATS—AN APPRECIATION.

By E. C. GORDON ENGLAND.

I HAVE read with a great deal of interest the many and varied comments, in both the technical and lay press, on Pegoud's flying, and it is remarkable to me that the writers have failed to grasp their true significance. Many people say that his flying is merely an acrobatic performance, and that he has undertaken these feats in the hopes that their extreme daring and novelty will result in the attraction of large gates, and that they should therefore be prohibited. Other people have expressed themselves very forcibly as to the mental condition of the man who takes such liberties with the aeroplane of to-day. Inventors claiming inherent or automatic stability for their machines loudly protest that we do not want a machine that will turn over any number of times without getting out of the control of the pilot, but one that will not turn over at all. Others admit that there may be some service rendered to the science by these demonstrations, but at the same time, they deplore the performing of them in public. But there are many who welcome his performances wholeheartedly, and pay tribute to the man who had the courage and the faith in the Blériot to carry them out.

In the first place, what we are all striving for is "safe" aviation, and, to my mind, if only proper consideration be given to these feats of Pegoud, the science of aviation will be greatly advanced, and the death roll reduced to an extraordinary extent. If a study be made of the enormous number of fatalities during 1913, one is struck by the extraordinary number of unexplained nose dives and cases of pilots being thrown from their machines while in flight.

Here is, in my opinion, the real lesson that we can learn from Pegoud's flights. I maintain that, had all these pilots been strapped in, none of them would have been killed. He has proved that on a modern machine of good design, there is no cause to give up all hope of effecting a safe landing should your machine be upset while flying at a reasonable height. This proves that all pilots should be strapped to their seats in such a manner as to preclude all possibility of their ever being thrown out, but at the same time, not hamper their movements in any way. I consider it the duty of every responsible person in the aviation world to impress this fact on pupils and inexperienced pilots. This point cannot be too seriously considered, as it is essential if we are to continue flying in anything like bad weather.

I am convinced, as the result of the study of air currents while conducting gliding experiments some years ago, that there are certain conditions existing which would destroy momentarily the stability of any machine of the present size, however naturally stable it may be. It is therefore useless for the machine to be self-righting unless the pilot is still on board. Therefore, let all pilots be strapped in.

The claims of the designers of automatically or inherently stable machines that these cannot be upset, leave me cold, for the above reason, and to other designers, I say unhesitatingly, "make certain that your machines are capable of being brought back to their normal position, whatever the position into which it may have been thrown, otherwise, your machines are useless, when pitted against the elements.

This brings me to the next important point. Pegoud has proved that, for a machine to be absolutely reliable, the engine must be capable of running in every position into which the aeroplane may be turned. Motor designers, are therefore faced with yet another problem, and that is how to keep the motor running although upside down. So far, the Gnome is the only one which can fulfil this condition.

To deplore the performance of these feats of Pegoud in public is inconsistent, as, if he is really doing good work, why should not everyone watch him? Surely that would do still more good, and I hope I am not alone in thinking this.

I trust that these facts will help to call attention to the pressing need of safety belts of really satisfactory design and their universal adoption by pilots. I sincerely hope that M. Pegoud will continue to demonstrate his remarkable feats, as only by constant repetition will the necessity of safety belts and a reliable motor be impressed on the minds of those who fly. To my mind, Pegoud has rendered the very finest service to the science of aviation, and has been the means of saving many lives. Let us not ungratefully hurl mud at one who is doing such a splendid work.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

THE events of last week at Eastchurch Aerodrome include the visit of the First Lord of the Admiralty, Mr. Winston Churchill, M.P., and the naval airship No. 3, the "Astra Torres," which had made a splendid voyage to Sheerness from Farnborough.

The Admiralty yacht "Enchantress" took up a berth off the Sheerness dockyard at 9.30 a.m., where Mr. Churchill watched the evolutions of the seaplanes connected with the Isle of Grain hydroplane station, some of which circled around the yacht and the adjacent battleships. Leaving in a steam pinnace, Mr. Churchill was soon landed on the pier, where he was received by Commander C. R. Samson, R.N., commanding the Eastchurch Naval Aviation School, and Capt.-Superintendent Prendergast, R.N. At the main gates of the dockyard a large grey naval car was boarded, Commander Samson taking charge of the steering wheel, and the aerodrome was soon reached. After inspecting the machines, which were drawn up in parade order, the hangars, &c., and Messrs. Short Bros.' factory, Mr. Churchill was taken up for an extended flight by Commander Samson in a Short biplane No. 3, their objective being the Isle of Grain, which was reached without incident.

Mr. Churchill and Gen. Sir Ian Hamilton entered Naval Airship No. 3, which was in charge of Lieut. N. F. Usborne, R.N., Lieut. W. C. Hicks acting as flying officer, and also on board, together with the crew, were Commander E. A. D. Masterman and Eng.-Lieut. Cave-Brown-Cave, R.N.

The airship cruised over to Eastchurch, passing over Sheerness, Minster, and arriving over the aerodrome carried out some graceful evolutions. The return journey to the Isle of Grain was made without incident, and the airship descended and was made fast until about 4 p.m. when she left for Farnborough. The advent of the airship following so closely on the visit of the "Delta" naturally caused some excitement, and the general shape and appearance of the two aircraft were noticed with interest.

Mr. Churchill again visited the aerodrome on Saturday where a general parade of aeroplanes were drawn up for his inspection, and the greater part of them took the air at different intervals during the afternoon. Mr. Churchill again made a flight of several circuits of the aerodrome in a Short No. 3, piloted by Commander Samson, R.N.

Capt. Geoffrey Cox, 3rd North Staffordshire Regiment (Special Reserve), who has recently taken his certificate at the Blériot School at Hendon.

Gordon Bell on Wednesday piloted a new "pusher" Short biplane through a test flight. This machine has been designed to carry a gunner placed in the prow of the machine, thus commanding an uninterrupted view below, free from propeller blast. A weight equivalent to the absent gun and gunner was carried in the machine. The test appeared to be very satisfactory, the machine lifting quickly and easily and a good flight was put up. The machine is of the usual type supplied to the services with the exception of the provision made for the gun.

Lieut. Spenser Grey, commanding the Calshot Naval Air Base has been at the aerodrome during the latter part of the week, flying an 80 h.p. Sopwith (No. 104). The naval flying has been of the usual high standard, the machines used being Shorts, Deps, Sopwiths, Avro, Bristol, Maurice Farman, Blériot, &c.

Brooklands Aerodrome.

ON Saturday last the Vickers and Bristol Schools were busy with pupils. Mr. Barnwell was out on the Blériot monoplane, and Mr. Pixton was busily engaged in tuning up the up-to-date Bristol tractor biplane which has now arrived at Brooklands, and which will prove an acquisition alike to Brooklands and to the machines of this type already there.

Mr. Hawker was engaged in fitting up the Sopwith biplane with the 100 h.p. Green engine, and as the time limit for the Michelin prizes has now been extended, he will doubtless make further attempts to win them, for which he will have the best wishes of his many friends.

On Sunday the continuous downpour precluded the possibility of any flying.

Bristol School.—No flying all day Monday last week, owing to wind and rain. On Tuesday, Lieut. Warren first out for an excellent solo, which was followed with a solo by Lieut. MacNeece. Pixton for several circuits with Mr. MacDonell in pilot's seat, then this pupil for first solo, making an excellent flight. Later Pixton circuits with Lieut. Bridson in pilot's seat, then this pupil alone for first time. Lieut. Hinds, and Lieut. MacNeece both out making excellent solos. Rain stopped flying for the rest of the day. Wednesday morning Lieuts. Hinds, Warren, and MacNeece, and Messrs. Finney and MacDonell all out for two good solos each.

In the afternoon, Pixton first out for a test, then Lieuts. MacNeece, Hinds and Warren, and Mr. MacDonell out for a good solo each. Pixton then up with Lieut. Bridson for landing practice. Later Lieuts. MacNeece and Warren, and Mr. MacDonell for another solo each. Darkness prevented further flying.

No flying during Thursday morning, owing to thick fog. In the afternoon Pixton for a test with Mr. Newton as passenger. Then Lieut. Hinds, Lieut. Warren, and Mr. MacDonell one flight each alone. Pixton with Lieut. Bridson in pilot's seat practising landings. Lieut. Hinds and Lieut. Warren another solo each. Rising wind prevented further flying.

Pixton out with Lieut. Bridson and Lieut. Robertson for a flight on Friday, both pupils being in pilot's seat. Solos were executed by Lieuts. Hinds (one), MacNeece (two), Warren (one), Mr. Finney (one), and Mr. MacDonell (two).

In the afternoon Lieuts. Hinds, Warren, and MacNeece, and Messrs. Finney and MacDonell for a solo each. Then Lieut. Bridson for a solo. Darkness prevented further flying.

Howard-Flanders School.—Wednesday, last week, Dukinfield Jones out before breakfast for hour test. Maintained altitude of about 1,500 ft. for 61 mins., when petrol ran out. Later out again for 10 mins. In afternoon out for 20 mins. Next day up in afternoon, testing after slight adjustment. Carried passenger. Later out for 10 mins. in wind of 30 m.p.h.

Vickers School.—Monday, last week, in afternoon, Barnwell testing biplane 26 in bumpy ground. Next morning Knight test biplane; 20 Messrs. Pierson, Coles, Malcolm, Kinsman and Batty-Smith solos. Paterson test biplane 26, then with Mr. T. Hinshelwood (new pupil).

Wednesday morning, Knight on biplane 20 test, then with Mr. Hinshelwood. Paterson with Messrs. Macdonell and Hinshelwood. Barnwell with same pupils. Paterson on biplane 26, Messrs. Kinsman and Pierson alone. Messrs. Pelham and Coles solos on biplane 20. Captain Wood and Barnwell on Blériot mono. Mr. Coles then went for his *brevet*, getting through in splendid style. In afternoon Barnwell testing biplane 26, then with Capt. Frankland. This pupil then solo. Messrs. Pelham and Malcolm solos. Knight on biplane 20 with Mr. Hinshelwood and Captain Frankland. Barnwell with Capt. Macdonell. Messrs. Batty-Smith, Kinsman and Malcolm solos.

Barnwell on biplane 20 with Messrs. Macdonell and Hinshelwood, Thursday afternoon. Messrs. Kinsman and Malcolm solos on biplane 26, Barnwell with Messrs. Batty-Smith and Kinsman. Paterson and Knight on biplane 20 with Messrs. Macdonell and

Hinshelwood. Barnwell test No. 3 mono., Mr. Newton-Clare straights.

Friday, in morning, Knight on biplane 20 with Messrs. Macdonell, Truman and Hinshelwood. Paterson with same pupils. Messrs Pelham and Truman solos. Paterson on biplane 26. Messrs. Malcolm, Pierson, Kinsman, Pelham, Batty-Smith and Howell solos. Captain Wood on Blériot. Major Kinsman and Mr. Pierson for *brevets*, both getting through in good style. In afternoon Barnwell on biplane 20 with Captain Macdonell and Mr. Hinshelwood. Knight with Messrs. Hinshelwood and Macdonell. Messrs. Frankland and Pelham solos. Paterson on biplane 26 with Mr. Hinshelwood. Barnwell with Messrs. Malcolm and Frankland. Messrs. Batty-Smith, Malcolm, Pelham and Frankland alone. Messrs. Joubert de la Ferte, Chataway and Webb straights on No. 3 mono.

Eastbourne Aerodrome.

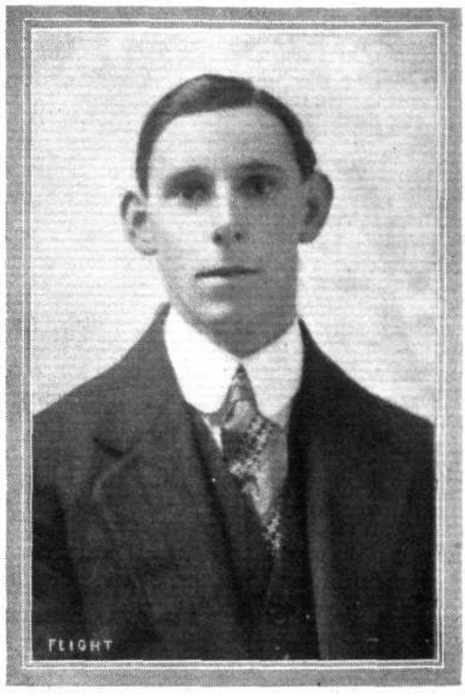
ON Wednesday last week, after a spell of bad weather, a considerable amount of school work was put in. Gassler had the E.A.C. 'bus out both morning and afternoon, and took the pupils up several times in turn. Messrs. Hunt, Thornley and Oxlade are all three making good headway. Thursday was a good day, and the school was busy again all day. In the evening, Lieut. Oxlade did two good solos.

On Friday, after Gassler had made the customary trial trip he took up Mr. Hunt. Mr. Thornley was then sent for his first solo, which he accomplished in good style, making an excellent landing. Lieut. Oxlade then flew the first half of his *brevet* test, flying steadily and well, and landing within five yards of the mark.

On Saturday morning, Gassler had the biplane out early and after a short test flight sent Lieut. Oxlade up for the second half of his *brevet*, and notwithstanding a rather bumpy wind, he completed his test in excellent style. Gassler then went up with Mr. Hunt, and Mr. Thornley was out on the 28 Blériot doing straights. Mr. Thornley, who is now flying the biplane quite well is ready for his ticket, and only awaits favourable weather to obtain it. Sunday and Monday were both blank days owing to constant wind and rain.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Mr. L. C. Kidd solo and figures of eight Tuesday last week, Mr. Strange circuits. Mr. Howarth (new pupil) rolling with Mr. Birchenough and afterwards alone. Messrs. Cripps, Lillywhite, Von Segebaden and North, straights with Instructor Birchenough.



Mr. J. W. H. Scotland, who completed his *brevet* tests last week at the Hall Flying School, Hendon. Mr. Scotland took his height tests at 350 ft.

Wednesday, Messrs. Kidd and Draper figures of eight. Mr. Strange, circuits, &c., Messrs. Von Segebaden, Howarth and Clarke, straights with Mr. Birchenough. Mr. Kershaw (new pupil) rolling with Mr. Noel. Messrs. Lillywhite, Cripps, Von Segebaden, straights with Instructor Manton and solo straights. Later Mr. L. C. Kidd entering for his *brevet* tests, landing absolutely on the mark and gaining his pilot's certificate.

Thursday, Mr. Strange and Mr. Draper circuits and figures of eight. Messrs. Cripps and Von Segebaden straights with Instructor Birchenough.

Mr. Lillywhite and Von Segebaden straights with Instructor Manton in passenger seat, Friday. Mr. Draper circuits and half spirals. Mr. Kershaw rolling with Instructor and alone. Mr. Blake circuits, &c., afterwards flying for his *brevet* and gaining his pilot's certificate.

W. H. Ewen School.—The weather was not favourable for flying practice on Monday last week, but on Tuesday the pupils were out at 11 a.m. After test flight by M. Baumann on *brevet* machine he handed it over to Messrs. McGregor and Scott who were making good straight flights with nice landings. On the 35 h.p. Caudron No. 2 Mr. F. W. Goodden was instructing Mr. Carruthers, who was rolling and doing short flights, while Messrs. Murray, Badgery, Cowling, Johnson and Lieut. Kinnear were rolling.

On Wednesday the school was out at 6.30 a.m. M. Baumann made a test flight on *brevet* machine, after which Messrs. McGregor and Scott were doing good straight flights and small turns. Test flights by Mr. F. W. Goodden on 35 h.p. Caudron No. 3. Messrs. Badgery, Cowling, Johnson, Murray and Lieut. Kinnear rolling and Mr. Carruthers doing short straights. At 3 p.m., Mr. F. W. Goodden was again out with pupils on No. 2. Messrs. Cowling, Murray, Carruthers and Lieut. Kinnear rolling and short flights, and Mr. Johnson rolling.

School out at 8 a.m. Thursday, M. Baumann instructing Messrs. McGregor and Scott, who were doing half circuits. Test flight by Mr. F. W. Goodden on No. 3; Messrs. Cowling, Kinnear, Carruthers, Murray, and Lieut. Fraser straights and Mr. Johnson rolling.

Capt. T. C. Mudie, who passed for his *brevet* recently at the Bristol School, Brooklands.

Mr. R. M. Boger, one of the new pupils to obtain his certificate at the Bristol School, Brooklands.

Lieut. A. Gallaher, 4th Dragoon Guards, who has recently secured his Royal Aero Club *brevet* at the Bristol School, Lark Hill.

At 2.45 p.m. on Friday, M. Baumann was on *brevet* machine with Messrs. McGregor and Scott, who were doing good half circuits. Mr. C. George then went through the second half of his *brevet* tests, flying well and landing on the mark. On Caudron No. 2, Mr. F. W. Goodden was instructing Mr. Murray who was doing straights, Mr. Carruthers and Lieut. Kinnear who were rolling and doing short flights, and Messrs. Johnson and Cowling who were rolling.

Salisbury Plain.

Bristol School.—Too windy for tuition all day Monday and Tuesday morning last week. In the afternoon Voigt with Mr. Courtney for a trial. He then gave biplane tuition to Lieuts. Huish and Harvey, and Air-Mechanic Locker. Jullerot for a trial on a biplane and one on a tandem monoplane. Mr. Tod two good solos on the tandem monoplane. Air-Mechanic Locker for his first solos on a biplane, solos being also made by Lieuts. Marsh and Dunn.

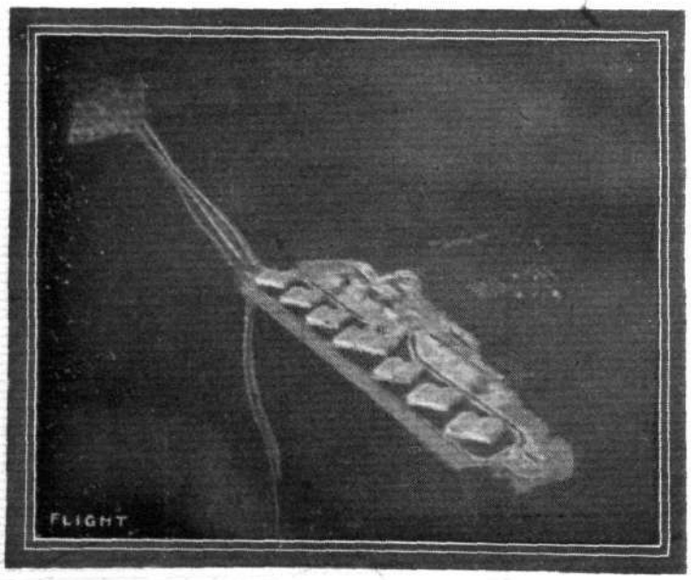
On Wednesday, Jullerot for a trial of two biplanes and a tandem monoplane. Voigt giving biplane tuition to Lieuts. Harvey and Huish, and Mr. Courtney. Merriam on tandem monoplane at 2,000 ft. to Upavon and back, ending with a spiral *vol plané* with engine cut off. Excellent solos on a biplane by Lieut. Huish, this being his first time alone. Lieut. Dunn two solos, Lieut. Harrison two, Capt. Buckland two, and Air-Mechanic Locker two. Jullerot again tested the air at 11.30, and found too bumpy for more tuition. In the evening Jullerot and Voigt each for trials on biplanes. Capt. Buckland then went for his ticket, which he successfully passed, flying in good style. Merriam on a biplane for a long flight with Lieut. Harvey, ending in a spiral. Merriam then up behind Lieut. Harrison, Mr. Courtney and Air-Mechanic Locker for landing practice. Voigt biplane tuition to Lieut. Huish, and Jullerot tuition to Lieut. Harvey. Excellent biplane solos by Mr. Dunn, two, and Lieuts. Huish and Marsh, and Mr. Courtney one each. Merriam finished day's work by a trip unaccompanied on a tandem monoplane.

Voigt a trial on a biplane on Thursday, and afterwards gave tuition to Lieut. Harvey. Very good solos on a biplane were done by Lieut. Gallaher (two), Lieut. Marsh (two), Lieut. Dunn (two), Lieut. Harrison (two). Merriam up behind Lieuts. Huish and Harvey, giving landing practice. Merriam a solo on the tandem monoplane, which finished morning's work. In the evening, Merriam a trial on a biplane with a passenger. Voigt also for a trial. Then excellent solos by Lieut. Gallaher, Lieut. Marsh, Lieut. Dunn, Lieut. Harrison and Lieut. Huish. Merriam up behind Lieuts. Harvey and Huish, giving landing practice. Merriam a solo on the tandem monoplane at a good height. This instructor then up with Mr. Tower for a short flight on a biplane.

Foggy first thing Friday. About 11.30 trials were made by Jullerot, Voigt and Merriam, with passenger, on biplanes, but unfit for tuition. In the evening tests were made by Jullerot, Merriam and Voigt, the latter instructor making two. Good solos on a biplane by Capt. Hay, Lieuts. Dunn and Huish, and Air-Mechanic Locker, one each, and Lieut. Harrison and Mr. Courtney two each. Merriam with Lieut. Harvey for a cross-country flight on the tandem monoplane, going *via* Netheravon and Upavon. On their return journey they encountered a thick mist which obscured all land marks, so a descent was made to ascertain their whereabouts, and found that they were near Newton Tony. Unfortunately, darkness overtook them, thus preventing their getting away, so the machine was secured for the night and flown over to the hangars next morning (Saturday), with Lieut. Dunn as passenger. There was still a mist about, and the return journey was exceedingly bumpy. In spite of the weather Lieuts. Gallaher and Dunn both successfully passed the tests for their certificates, flying very well in each case.

Weather too misty for tuition all day Saturday.

Mr. F. Warren Merriam making a fine high flight on the Bristol tandem monoplane at Salisbury Plain on October 10th.



NETHERAVON AERODROME.—Misty at 2,000 ft. up. Taken during a *vol plané* from a BE. A snap by a member of the 3rd Squadron, R.F.C.

Royal Flying Corps. 3rd and 4th Squadrons (Netheravon).—On Monday, last week, there was good flying. Lieut. Wadham was out early on his 70 h.p. Blériot 221 for two flights, once with Lieut. Charton. Major Brooke-Popham was out on Avro three times. Later, Sergt. McCudden took over the machine, and made four flights. Lieut. Birch and Capt. Picton-Warlow were out early in the morning.

Lieut. Joubert-de-la-Ferte led off on Tuesday early on Blériot, flying round the aerodrome for 40 mins., afterwards he flew to Brooklands in 55 mins. Lieut. Wadham later out on Blériot for 2 hrs. 5 mins. Sergt. McCudden on the Avro for 55 mins., relieved later by Capt. Picton-Warlow and Lieut. Birch. Lieut. Conran also on 70 h.p. Blériot for three flights, twice with Air-Mechanics Barlow and Pratt as passengers.

Lieut. Joubert-de-la-Ferte arrived back on Wednesday from Brooklands, calling at Farnborough on his way. Lieut. Conran also on Blériot for four flights, taking up Mechanics Macrostie, Barlow, Robertson and McCudden. Lieut. Wadham also taking up Mechanics Bibby, Morgan and Bowyer. Lieut. Cholmondeley on Henry Farman for a short flight, after which Lieut. Shekleton made two flights on same machine.

On Thursday Lieut. Joubert-de-la-Ferte went to Farnborough and back on a Blériot. Later made a flight round the aerodrome. Lieut. Stafford, on Henry Farman, with Mechanic Littlejohn, went to Cheltenham and back. Lieut. Porter, on BE 204, with Mechanic O. Grolligan, also visited Cheltenham. Lieut. Conran, on Blériot, after one flight round aerodrome, also went to Cheltenham with Capt. Beor, taking 1 hr. 42 mins. for the double journey. Lieut. Wadham, on Blériot, up three times. Lieuts. Cholmondeley and Shekleton were out alternately on Henry Farman, and Capt. Picton-Warlow went up twice on an Avro.

On Friday, Lieut. Wadham on Blériot and Major Brooke-Popham on Avro were out early, and on the latter machine Lieut. Birch made one, Sergt. Ridd two, Sergt. McCudden three flights. Lieut. Stafford on Henry Farman for four flights, taking up Major Brooke-Popham three times, and Capt. Picton-Warlow. Capt.

Herbert, Lieut. Allen, and Lieut. Cholmondeley were flying a Henry Farman, and later Lieut. Stafford made another flight, followed by Lieut. Allen, two trips, and Major Brooke-Popham three flights. Lieut. Shekleton on Henry Farman 352, up three times, and Lieut. Cholmondeley once. In the afternoon, Lieut. Cholmondeley took up Capt. Mostyn Pryce of the Rifle Brigade, and Lieut. Davis of the King's Royal Rifles Lieuts. Conran and Wadham were flying their Blériots on Saturday.

The Marquis Larienty-Tholozan a nephew of the Marquis De Dion and a well-known aviator in France, was flying on Saturday last at the Hendon Aerodrome on his new Farman biplane fitted with a 120 h.p. 8-cyl. De Dion Bouton engine. Although the Marquis had never previously taken his seat in this machine, without a hitch, after the propeller had been given its usual spin, he was up in the air and made two circuits of the aerodrome.

FLYING AT HENDON.

ONE of the items down on the programme for Thursday of last week was a speed race between Morane-Saulnier monoplanes. Unfortunately, on the day in question Gustav Hamel was unable to be present, so only two of these speedy little machines took part, viz., R. Slack's 80 h.p. and Philippe Marty's 50 h.p. The latter received 10 secs. start, but as Slack's engine was not running well, Marty proved an easy winner, Slack only gaining 6 secs. In addition to this race several exhibition and passenger flights were made by the following pilots, Verrier and Noel on Maurice Farmans, Norman Spratt on the Breguet, Manton and Birchenough on G.-W. 'buses, E. Baumann on the 60 h.p. Caudron, P. Marty on the Morane, B. C. Hucks and Geo. Lee Temple on Blériots, the latter making very fine high flights. Later in the afternoon G. M. Dyott came out on his monoplane which was built to his designs by Messrs. Hewlett and Blondeau early this year, and which he flew in America.

The Second October Meeting last Saturday was very well attended considering the time of the year. However, flying has "caught on" to such an extent that it looks as though these week-end meetings will make good throughout the winter, and they deserve it thoroughly. From about 3 to 3.30 p.m., exhibition and passenger flights were put up by W. Birchenough, R. H. Carr and Marcus D. Manton on G.-W. 'buses, Louis Noel on the G.-W.-Maurice Farman, Lewis Turner on the 60 h.p. Caudron, Philippe Marty and R. Slack on the 50 h.p. and 80 h.p. Morane-Saulnier monoplanes respectively, and B. C. Hucks on his 80 h.p. Blériot "Tornado." Pierre Verrier brought out and tried a new type Maurice Farman belonging to the Marquis de Larienty Tholozan. This machine differs from the other Maurice Farmans in that it has no front elevator, has a different wing-section, a Henry Farman type landing chassis, and an 120 h.p. 8-cyl. V-type De Dion engine. Judging from its performance in the hands of Verrier it appears to be a highly successful combination of the two Farmans, having the advantages of each type, the lightness and speed range of the "M.F." and the speed and unobstructed view of the "H.F." Gustav Hamel appeared above the aerodrome on his 80 h.p. Gnome-Morane-Saulnier, with a passenger, just before the first heat of the speed handicap started, and at about the same time G. M. Dyott came out on his monoplane and put up several circuits of steady flying. The first heat of the speed race (6 laps) was made up as follows: R. H. Carr on the 50 h.p. G.-W. 'bus (4 mins. 27 secs.), Louis Noel on the G.-W.-Maurice Farman (2 mins. 26 secs.), W. L. Brock on the 80 h.p. Blériot (7 secs.), and R. Slack on the 80 h.p. Morane (scratch). Carr had great difficulty in making headway in the stiffish breeze that was blowing, and gradually dropped behind; Noel soon obtained the lead, which he retained until just before the finish, when Brock got home 7 seconds ahead. Slack followed Noel by 8 seconds. The second heat (6 laps) produced five starters—W. Birchenough (5 mins. 15 secs.) and Marcus D. Manton (3 mins. 55 secs.) on G.-W. 'buses, E. Baumann on the 60 h.p. Caudron (2 mins. 43 secs.), Pierre Verrier on the new 120 h.p. Maurice Farman (1 min. 35 secs.), and Philippe Marty on the 80 h.p. Morane Saulnier (scratch). The Maurice Farman developed a remarkable turn of speed—something well over 50 m.p.h.—and came home an easy winner, 23 secs. in front of the second man, Marty, who worked his way well up from scratch. Manton came in third 17 secs. after, with Baumann only 8 secs. behind him. Birchenough also found it hard flying as Carr did, and came in last. The final heat of 8 laps evolved itself into a hard fight for first place between the limit man, Noel, and the scratch man, Marty. The latter, however, had to be content with second place, for Noel kept ahead all the time and got home 11 secs. in front. Verrier came in third only 3 secs. behind Marty, with Brock following some 2 secs. after. We give below the result of this heat in tabulated form.

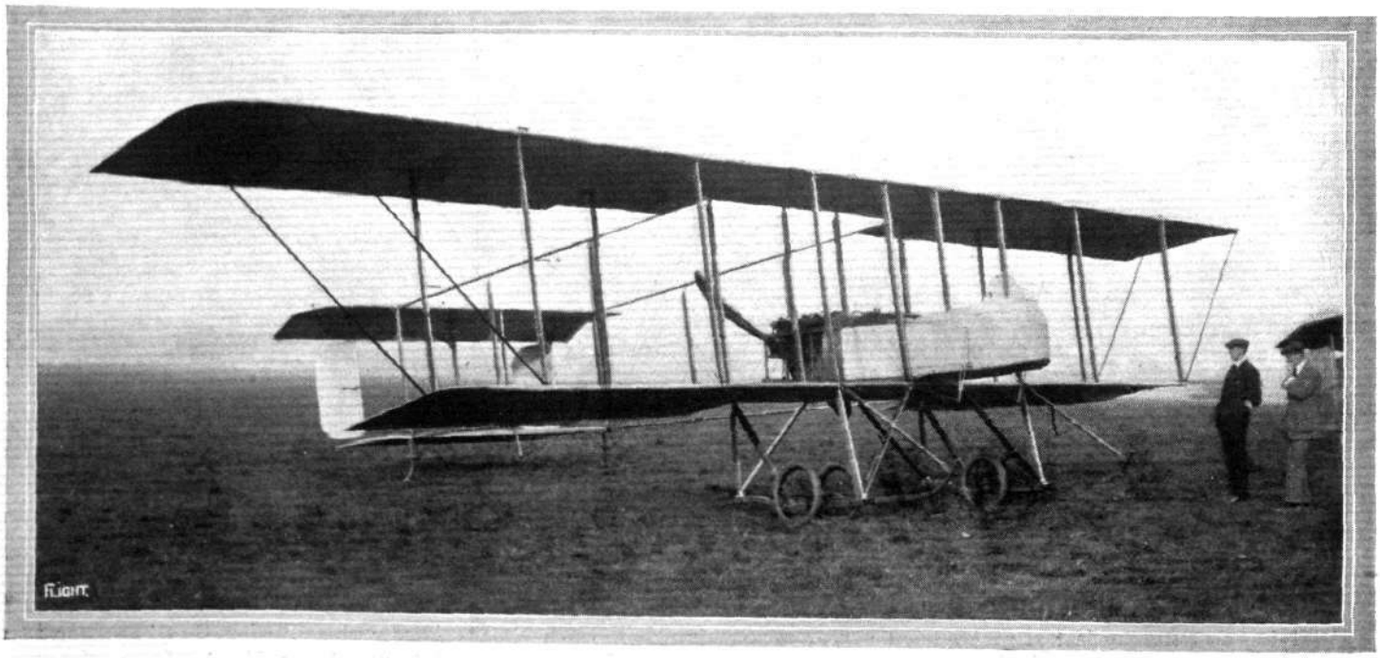
Speed Handicap. Final heat (8 laps). Trophy and prizes presented by Capt. Ernest Bass.

		Handicap.	Handicap Time.
		m. s.	m. s.
1.	Louis Noel (70 h.p. Renault-Maurice Farman biplane)	4 6	14 27
2.	Philippe Marty (50 h.p. Rhone-Morane-Saulnier monoplane)	scratch	14 38
3.	Pierre Verrier (120 h.p. De Dion-Maurice Farman biplane)	1 19	14 41
4.	W. L. Brock (80 h.p. Gnome-Blériot monoplane)	0 25	14 43

In between the first and second heat, G. Lee Temple came out on his 50 h.p. Blériot and made a very fine high flight, lasting about 25 mins.; after reaching a height of something near 6,000 ft., he descended with a series of spirals.

After the second heat, B. C. Hucks took up a "cine-man," whilst during the final heat Hamel, with a passenger, performed a series of banks just outside the aerodrome. After the racing several more exhibitions were given, there being a somewhat exciting incident immediately after the final heal. Noel, before landing, proceeded to put up some of his well-judged banked spirals, when it was observed that one of the upper-plane extensions had one of its struts hanging loose. Signals were made to Noel, who was quite unaware of what had happened, and eventually he made a safe landing, much to the relief of those who saw what was wrong. Later on five machines were to be seen up in the air together.—Slack's and Hamel's 80 h.p. Morane-Saulniers, Temple's Blériot, Baumann's Caudron, and the new Maurice Farman piloted by its owner, who handled his mount in fine style. Spratt on the Breguet, Verrier on the Maurice Farman, and Hamel on his Morane-Saulnier continued flying until it was practically dark.

The next day, Sunday, was absolutely unfit for aeroplanes, though perhaps quite all right for submarines, and was, consequently a blank day.



The new Maurice Farman biplane without front elevator which arrived at Hendon Aerodrome last week.

ARMCHAIR REFLECTIONS.

By THE DREAMER.

The March of Progress.

I AM a great lover of Dickens. A few years ago I should have been ready to say that Dickens was the greatest writer of his class of literature that ever lived, and perhaps at that time I should have been right. To-day I am prepared to think that the world has caught him up. If Dickens lived to-day, and wrote as he used to write, I do not think he would stand the chance of climbing to the top as he did in his day: others are writing every day, stuff as good as he did, and are only looked upon as "ordinary." Shakespeare wrote his plays many years earlier than Dickens, and no one up to the present has ever caught him. Shakespeare is as much in advance of the world to-day as he was at the time he wrote. I do not like all he wrote; I do not like the language he sometimes uses, but no doubt, in his day, speech was rather more free than that which is looked on in good society to-day as being legitimate. Nevertheless, if Shakespeare lived to-day he would be a man whose ideas and vocabulary would be far in advance of most. Going back to still more ancient times, we come across men who in their day were so great that they were not understood, yet whose teachings have never been surpassed or refuted. It seems to be that in the arts, such as literature, philosophy, music, painting, &c., men can excel, not only in their day, but to be never surpassed. With other things it is different. We have had great surgeons in the past, but we have to-day surgeons as great. In most things, what one man can do, others with practice can do, but this is not so in everything, or with every man. Pégoud was a wonderful man in his own way, but it is quite unnecessary that all aviators should try to do what he did. If none of our pilots try to imitate him we shall not think less of them, we should, in fact be inclined to think less of them for being fools enough to try. What Pégoud did, does not necessarily set a standard of excellence in flying: it was a thing quite outside the necessary, and I am glad to find the excitement in aviation camps caused by his feats, dying down.

In the handling of their machines, however, our pilots are becoming more skilled every day. One has but to look back through the numbers of this journal to see what, only a year ago, was considered flying of such character as to warrant a full page photograph, and then to glance at the pictures published during the last few months.

But a little while ago, the spiral descent of Hamel was a thing to watch for; now we never expect to see him, or any one else descend any other way. Some of the things done at Hendon to-day would have been fatal a year ago owing to lack of skill in all concerned, yet there are one or two little things which even now I would be pleased to see left out. One little "stunt" which seems to be gaining favour with most pilots is the sudden dive at the end of the last lap in racing. It is rather impressive to watch, and is in the nature of a salute on crossing the line for the last time. The pilot does a sudden dive straight at the line and then suddenly rises at a steep angle. To see each machine do this in turn is rather nice, but the skill now exercised in the handling of machines makes some pilots fly a very close course, and I have seen on more than one occasion a pilot win a race right on the post by flying under or over an opponent. A pilot on a slow machine may not know that one on a very fast machine is rapidly overhauling him and will pass him on the very line, and a sudden dive may land him on top, as a sudden rise may get him fixed up in the under-carriage of the other machine, with disaster to both. It would, I think, be better not to do this, but to fly on until they can see that the way is clear, and then turn off the course. At Brooklands track, motors having crossed the winning line must keep straight on and reduce speed gradually; it would soon result in a fearful mix up did they do what they liked, once they crossed the line, without any thought of those following.

Steeplechasing over machines on the ground I do not like, and one day there will be a nasty smash up. It has been all right up to now, but some day a machine will fail to rise quickly enough owing to a small *remous* or some other cause, and that little "yard" by which the pilot hopes to clear will not be there.

The Porpoiseplane. A Fine Sport for next Summer.

"Circumstances find us strange bedfellows" is a very old saying, and truly circumstances in sequence cause strange happenings. For instance, the fact that yesterday, Sunday, was wet and kept me indoors, was the start of a series of circumstances which will, I hope, lead on to fortune. Yesterday, as I say was wet; you may have noticed the fact, and as I did not go out I did not get my Sunday paper: fact one. I have to travel every morning from Liverpool Street on the tube to Leicester Square, change at Tottenham Court Road. I have made this journey every morning since the tube extension was opened, and never before has any trouble arisen. This morning I laid down my twopence and said Leicester Square as usual, but the boy gave me a ticket for Oxford Circus. I am quite content to get a ticket, and never take the trouble to read it. This morning I was stopped at Tottenham Court Road, and another penny demanded if I wished to travel on to Leicester Square. I demurred: I had paid my fare and had a right to be carried: I pointed out that I ought not to be charged up with the mistakes of the company's assistants. I was told that I should read my ticket and make quite sure it was issued to the station to which I wished to travel. I pointed out that they did not issue a ticket with Leicester Square printed on it anyway, and asked how long I was supposed to stand and argue the point with the issuing clerk, and so block up the gangway, seeing that tickets for Leicester Square were printed for Charing Cross to which I did not want to go. I would not pay, and they would not let me go through, so I cut the matter by going up in the lift and walking down Charing Cross Road: fact two. Halfway down the road I met a man I had not seen for some time. Had it not been for the ticket incident I should not have met him. Now, when two men, who have not met for some time, meet, it is absolutely impossible to part without celebrating, so we celebrated, early as it was. On the counter in the tea-shop I found Sunday's *Lloyd's*. If it hadn't been wet yesterday, and the ticket, and the man, and the celebrating, I should have had quite another paper and not *Lloyd's*, and should never have got the idea for the "Porpoiseplane" and the fortune; such then is the sequence of circumstances.

This is what I read:—"Early in the afternoon the

seaplane No. 88 left its hangar and made a dash up the harbour. The machine rose gracefully, but suddenly turned her nose seawards and dived into the water, disappearing beneath the waves. She rose again in a few seconds, but when near the mouth of the harbour the machine turned sideways and collapsed. When she struck the water there was a loud explosion and the machine disappeared. Tugs were quickly on the scene and the two officers were rescued from the wreckage. The machine was subsequently salved."

To allow a machine to turn sideways after having the skill to execute the porpoise business and come through it successfully is beyond me. What I see in the matter is money, and fine sport. I do not know exactly how this machine is built, but I can probably find out. Now, of course, you can no doubt see the wheeze, and want to take some shares. On the coast in the summer; a few porpoiseplanes; a few pilots; pilot and passenger in bathing costume; dive from 200; guaranteed under-water flight of 100 feet; two guineas; fortune; retirement; there you are, all through a wet Sunday and what followed.

THE RELATIONSHIP BETWEEN ELECTRO-OPTICS AND AVIATION.*

By HENRI COANDA, Technical Director of the British and Colonial Aeroplane Co.

IN order to accept the following conclusions it is necessary to admit the non-existence of the infinitely small material atom, and to replace this immaterial atom by an enormous energy.

It is the existence of this energy that enables us to understand how there is a direct relation between two phenomena, or how there is a relation between two effects of energy by the intermediary of a substance that changes its state during transmission.

This hypothesis, the result of the work of Ramsay and Thompson, enables us to comprehend the effects of visible and invisible sun rays on the electric state of the earth's surface while they pass through the atmosphere.

Since Faraday in 1845, who communicated a paper on electro-optical phenomena to the Royal Society, until the contemporary study of Hertzian waves, the relationship between electricity and light through the intermediary of matter has been remarked and studied.

I give the following abstract from Faraday's paper of 1845 to the Royal Society, on "The Action of Elements on Light, and electro-optical phenomena" (as given by Dr. Giurgea):

"For a long time it has been my opinion, amounting almost to a conviction, shared, moreover, I believe, by many others among those who love the study of natural sciences, that the different forms in which matter manifests have a common origin; in fine, that they are in such relationship, in such connection, that they can be converted, so to speak, the one into the other, and that there exists in their respective actions equivalent power."

Later, in the conclusion of this same law of Faraday's, we find a very interesting observation:

"Magnetic force does not act on the ray of light directly, and without the intervention of matter, *but through the intermediary of the substance in which they exist simultaneously with the ray.* The substances and the forces transmit the one to the other, and receive, the one from the other, the ability to act on the light."

Subsequently, in 1865, Maxwell wrote the electro-magnetic theory of light.

The explanation of electro-magnetic phenomena is based on the wave motion of light, which supposes the existence of a medium. The electro-magnetic medium possesses identical properties to those of the medium in which light is propagated. The luminous body expends a certain quantity of energy, and if this light is absorbed by the other body, the latter grows warm. In the interval during which the light leaves the first body, but is not yet received by the second body, it exists as energy in the intermediary medium. One part of this energy is potential, the other is kinetic, as is proved by the research of Huygens, Fresnel, Young, Green, &c.

The potential energy is due to the deformation of the elementary particles of the medium, which brings with it the following conclusion:—The medium must be regarded as elastic. As the kinetic energy is due to a vibratory movement, the medium must have a finite density. We can thus determine this energy in two forms: electro-static and electro-kinetic.

Dr. Kerr, of Glasgow, published in the *Philosophical Magazine*, in 1865, an article, entitled "A New Relationship between Electricity and Light." The phenomena observed by Kerr differ from those observed by Faraday for the magnetic field. Kerr found that the dielectric sustained a deformation that rendered it doubly refracting, and the light that is depolarised will be polarised elliptically.

In reference to the action of the electric field on gases, I recall the theory of Professor Lippmann on their electric contraction. Dr. Giurgea investigates the phenomenon of electric double refraction discovered by Kerr, of the refractive index or electrolysed gases, and of the electric contraction of gases discovered by Dr. Boltzmann, and studied theoretically by Prof. Lippmann. These phenomena are produced simultaneously, inseparably, under the action of the same electric field.

At the end of their experiments, it was well proved that gas contracts under the action of an electric field. Further, the movement sustained by a vapour can be considered as anisotropic, for an electric field that deforms a dielectric has every chance of making it anisotropic.

Following the study of these phenomena, Dr. Giurgea sought to determine the value of Kerr's constant, to demonstrate that electric double refraction of bodies is strongly influenced by a thermal double refraction of the opposite kind.

This thermal double refraction is due to the *infra* red rays of a length of 850–910 $\mu\mu$. At the moment of the disappearance of the electric double refraction, it remains as hysteresis in the matter. Its value is greater according as the duration is longer. It has been remarked that the production of thermal double refraction does not correspond to a general rise in temperature, but to a local rise of temperature following the lines of force.

During the production of the electric field, and during the whole period of the electric action, considerable mechanical disturbance of the matter is produced, and violent eddies are formed.

We are now in a position to comprehend the movements of aerial currents independently of the increase in the density of the atmosphere, and dependent above all on the dielectric constant of different gaseous mixtures or vapour. The electric potential of the atmosphere varies under the electro-optic influence of visible and invisible rays from the sun, and under the electro-static action of clouds. It is especially to be emphasised that asymmetry caused in any medium by energy is opposed by a deformation of matter.

Solar light, visible or invisible, is the agent that emits the lines of force from the sun, and there are also vibrations of matter. Lines of force emitted from a body depend on its nature, and their direction is largely governed by its form. The lines of force at the surface of the earth are thus governed by the nature of the surface and the sub-soil.

Water is the most active of all bodies, equally so if the stream is subterranean. The lines of force emitted by the water are attracted by the solar rays.

This atmospheric electric potential in the neighbourhood of the earth depends solely on the local meteorological state above mentioned. This tension depends also on the nature of the earth and sub-soil, and the electricity accumulates for preference on the water courses, subterranean pools, and metalliferous strata, and it is this nature of soil and sub-soil that determines in an exact manner the electric state of the atmosphere at the earth's surface.

By following the variations of this surface electric potential, one can map out the nature of the soil and sub-soil, provided that due allowance be made for the influence of the sun's rays, and for the electro-static effects of clouds. At a given point in the atmosphere near the earth, the same variation of electric potential will always be produced by the same meteorological conditions.

It is, above all, the ultra violet rays below 252 $\mu\mu$ in length that affect the lines of force for the soil and sub-soil. These rays are absorbed by the air, which explains why variations of electric potential in the atmosphere are felt when the luminous rays traverse a less thick layer of air. This is the case when the ray is nearly vertical. Other factors may also influence matters—for example, ozone, which has a greater affinity for these rays.

When an aircraft moves with a certain speed, it becomes by friction against the air a very sensible electroscope.

[* Translated from the French.—ED.]

Lines of force influence the aircraft that has become an electroscope. For this reason one can determine more or less exactly at at certain moments of the day, that when flying above a known spot an aircraft is subjected to a finite movement. Not knowing to what to attribute these harsh movements, which the control is unable to counteract, they have been called by the general terms "heat remous," "air-holes," &c. They are very dangerous and very rough. One wing alone sometimes enters the region of disturbance, and is suddenly arrested in a way that swings round the machine. Often the whole aircraft is suddenly drawn down or thrown upwards, without those on board following the same movement. These are the lines of force due to the nature of the soil and sub-soil, which under the influence of the solar rays pass through maxima and minima, acting on the flying electroscope.

Since for the moment we cannot change the intensity or direction of the lines of force, we must try and render the aircraft as slightly sensitive as an electroscope as possible. What changes its sensitiveness is its surface electric potential, so we we must look first of all for the means of producing the least electricity possible, and secondly for means for neutralising its effect, or for facilitating its rapid dissipation into the surrounding medium.

Let us take, for example, the Bristol monoplane, which I know in every detail. I need 49 h.p. to fly horizontally at 120 k.p.h., with a weight (of machine only) of 830 kilos. For support and driving power proper, eliminating friction, we use 42 h.p. Thus, 7 h.p. are absorbed by friction.

In measuring the heat generated by the friction, we see that it corresponds to no more than a fifth part of the calories, equivalent to 7 h.p. It remains, therefore, to ascertain in what form the other four-fifths of the 7 h.p. manifests itself. The varnish on the wings has a cellulose base. If we rub lightly, and at a moderate temperature, on this varnished surface, we find that the varnished surface quickly adheres to the hand. This electricity is dissipated, however, after an interval under an ionising action. If the surface is varnished with a material having an acetate of cellulose as a base, and is coated on the surface with a varnish made according to the directions of E. Castelaz and Depoully, in a patent of 1879, we shall find a tendency towards a more rapid dissipation of the electricity into the surrounding air. This tendency is again augmented by the procedure of Wachendorff, described in a patent of 1905. Wachendorff mixes in his varnish a hydro-oxide or a basic silica of aluminium. The latter procedure facilitates such rapid discharge of the electricity that it is difficult to exactly measure the quantity produced by the friction.

The colour of the varnish has a great importance under the influence of the ionising rays. The best colour for varnishes of a cellulose base is blue-black or brown-black.

In measuring the work done on overcoming air friction on a moving surface, we arrive at results similar to those of Zahm and Franck.

Their formulæ, however, cannot give a perfect relationship, since they neglect the exterior of the surface. I, therefore, made the following experiment :—

The conduct of these tests is a delicate matter, on account of the very feeble forces to be observed and the complications that intervene. In a bell-jar I produced the best vacuum that I could obtain. Therein I placed a very thin flywheel, which was rotated by an electric motor. By this means I measured the friction of the bearings. Then I admitted air, and measured the power absorbed at different speeds, from which figures I subtracted the corresponding losses in the bearings, and so determined the work done on air friction. I then enlarged the flywheel so as to increase the peripheral surface, for which I could ascertain the exact speed. Again I made a vacuum in the bell-jar, and again introduced air as before. In this way I ascertained that the friction within wide limits is proportional to the air pressure on the surface and to the square of the speed.

I changed the hygrometric state of the air for a given pressure, and found very slight variation in the power. In enlarging the surface I noticed that the friction was not directly proportional thereto, but that it was proportional to the total pressure exerted on the surface.

Finally, I insulated the surface from the rest of the flywheel, and was thus able to measure the static electricity produced. The charge rapidly attained a maxima, and stayed there. This maxima varied within wide limits with the quality of the surface. The temperature variation around the flywheel, or on the flywheel itself, is very difficult to measure.

From these experiments I found that the greater part of the power expended on friction went into the production of surface electric potential, which establish a state of equilibrium by contact with the surrounding medium.

If we take a wooden surface that is highly polished, and is under a pressure of 760 mm., we can prove the formula of Franck to be correct. This formula gives: $F = 0{\cdot}365$ kg. /meter^2 for a speed of which the second power is 1,000. So long while the maximum value observed on the ordinary varnish is very high, the results for metallic varnishes reach very low maxima—that is to say, they facilitate the rapid discharge of the surface electricity into the surrounding medium.

In order to complete these tests I tried, but without much success, to make some out of door experiments with large kites. Also I tried model kites in a wind tunnel to obtain the pull on the wire for varying wind speeds. Experimenting afterwards on a much larger scale, I hoped to determine the speed of the wind by the pull on the wire (taking account, of course, of the weight of the wire). The results were unsatisfactory, and I do not think the means employed were of the best. However, I was able to ascertain in a very high wind by covering the cable with a small copper wire to make it a good conductor, the anchorage of the cable being insulated from the earth, that the electrical state varies very little while the sky is free from clouds. These changes become very irregular when the sky is overcast, and when clouds cross the sun so that the kite flies either in full sunlight or in shade. The variations did not correspond at all to the changes in the pull on the cable, which was produced by a fluctuating wind. I do not, however, care to deduce anything from those experiments which, although interesting, were not very perfect.

From my experiments I conclude that an aircraft is an electroscope, the more sensitive if it flies fast, its sensitiveness being proportional to the square of the speed. The sensitiveness is also related to the weight of the machine on account of the connection between pressure and weight. The size of the surface itself is of no consequence.

Then, to be able to fly in daylight under the electro-optical reactions between the solar rays and the earth over which the machine is flying, it is necessary that the aircraft should fly slowly and should be light, and that its colour should facilitate the rapid discharge of surface electricity generated during flight by the friction of the wings. Further to facilitate the discharge it would be useful to turn towards the rear of the machine such members as may conveniently be made pointed in shape.

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An Aeroplane Rally at Monte Carlo.

ONE of the most ambitious schemes which has yet been put forward by responsible people in connection with the aeroplane is nothing less than an International Rally on somewhat similar lines to the meetings for motor cars which have proved so popular on the Continent. The organisation is by the Sporting Club of Monaco, and it is proposed to have the rally at Monte Carlo during the first fortnight of next April. Seven routes have been provisionally selected, each of approximately the same length :—

1. London–Calais–Dijon–Toulon–Monte Carlo.
2. Brussels–Calais, and then as No. 1.
3. Paris–Angers–Toulouse–Toulon–Monte Carlo.
4. Gotha–Frankfort–Dijon–Toulon–Monte Carlo.
5. Madrid–Bilbao–Toulouse–Toulon–Monte Carlo.
6. Vienna–Agram–Venice–Genoa–Monte Carlo.
7. Rome–Turin–Venice–Genoa–Monte Carlo.

The entrants will be free to start from March 31st to April 14th, and they must arrive at Monte-Carlo not later than April 15th. The prizes amount to £3,000, and will be divided as follows : To the pilot making best time over any itinerary £1,000, the best time by a machine of over 25 square metres surface, £400, the second best time over any itinerary £200. The best time over each route will secure for the pilot £200.

AIRSHIP NEWS.

The New Veeh Dirigible on Trial.

THE new Veeh dirigible was out for a trial on Saturday last, and after a short voyage along the Rhine valley with thirteen persons on board, returned to her shed at Dusseldorf. When she came to landing, however, the airship refused to answer the helm, and as the wind threatened to drive the vessel against her shed, there was considerable anxiety for some few minutes. Eventually the airship was got under control, but not before three soldiers had been injured.

The Causes of the Zeppelin Disaster.

A REPORT by Dr. Eckener on the catastrophe to the German naval Zeppelin L2 attributes the disaster to :—

1. The passage-way connecting the gondolas having been placed inside the carcase.
2. The gondolas having been brought nearer to the envelope.
3. The placing of a wind screen at the front of the leading gondola, which contained two motors.

The report indicates that it was the wind screen which was really the primary cause of the disaster, as owing to its suction effect it caused the gas escaping from the ballonets when the airship rose, to collect in the gondola where it was ignited by a spark from the motor.

THE LATE MR. E. W. CHEESEMAN.

AT THE SOUTH AFRICAN FLYING SCHOOL, KIMBERLEY.—Mr. C. Compton Paterson, Managing Director, and the late Mr. E. W. Cheeseman.

A PATHETIC reminder of the fatal accident to Mr. Cheeseman in Africa is to hand this week, in the form of a letter to a member of the staff of FLIGHT, dated Kimberley, two days before his mishap, and two photographs which we reproduce. In this he writes as follows :—

"I am enclosing two photos of the South African Flying School. I am instructing the future Officers of the South African Aviation Corps and also a fair number of civilians, including a lady. We have made fairly good progress. We have two Paterson biplanes, one a front elevator type, and the other, built out here by a pupil (Mr. H. Carpenter), is of the Henry Farman type, but a Paterson section.

Kimberley Aerodrome is 4,000 ft. above sea-level, but the old 'busses lift well with instructor and pupil. The aerodrome is five miles round and a track like a billiard table. Both machines are fitted with 50 h.p. Gnomes. I shall have pleasure at a later date in forwarding photos of the locally built 'bus, and other photos of interest.

"Give my kind regards to the boys and accept best wishes for yourself."

AVIATION IN SOUTH AFRICA.—South African Flying School, Kimberley. Reading from left to right: (kneeling) Messrs. Williams, Van Coller, Creed; (standing) Messrs. A. Turner (chief mechanic), Cleasdale, Van der Spey, Turner, Carpenter, Emmet, Salamon; seated in machine, Chief Instructor the late E. W. Cheeseman.

BRITISH NOTES OF THE WEEK.

THE ROYAL FLYING CORPS.

The following appointment was announced by the Admiralty on the 23rd ult. :—

Capt. A. C. Barnby, R.M.A., to the "Hermes," additional, as Flying Officer for Isle of Grain Naval Air station, temporarily, to date October 2nd.

The following appointments were announced in the *London Gazette* of the 24th ult. :—

Central Flying School.—Brevet Major Hugh M. Trenchard, D.S.O., the Royal Scots Fusiliers, from an Instructor, to be Assistant Commandant (graded as Squadron Commander). Dated September 23rd, 1913.

Lieut. Frederick A. Wanklyn, Royal Artillery, from a Flying Officer, to be officer in charge of transport (graded as Flight Commander). Dated October 6th, 1913.

R.F.C.—Military Wing.—Capt. William D. Beatty, Royal Engineers, a Flight Commander, to be officer in charge of stores (graded as Flight Commander). Dated August 8th, 1913.

Lieut. George B. Hynes, Royal Artillery, a Flying Officer, to be officer in charge of mechanical transport (graded as Flight Commander). Dated October 1st, 1913.

R.F.C.—Military Wing.—*Special Reserve of Officers.*—Second Lieut. (on probation) Denys Corbett Wilson resigns his commission. Dated October 25th, 1913.

The following appointment was announced in the *London Gazette* of the 28th ult. :—

Central Flying School.—Capt. John M. Salmond, the King's Own (Royal Lancaster Regiment), an instructor graded as Flight Commander, to be graded as Squadron Commander. Dated May 31st, 1913.

ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending October 24th :—

No. 1 (Airship) Squadron. Farnborough.—The "Beta," and "Delta" were out most days during the week carrying out instructional flights. Several free balloon trips were also made for preliminary training in air work.

No. 2 Squadron. Montrose.—Four more machines left Farnborough for Montrose by air during the week. Two have arrived and the others are at York, having been delayed by fog. There has been a considerable amount of flying in connection with practice in reconnaissance over the country round Montrose.

No. 3 Squadron. Netheravon.—All three "flights" of this squadron have carried out numerous reconnaissance flights throughout the week, including journeys to Oxford, Cheltenham, Winchester, Farnborough and Brooklands. 1,750 miles were in all covered.

No. 4 Squadron. Netheravon.—The pilots of the Maurice Farman flight were flying daily.

No. 5 Squadron. Farnborough.—The officer pilots were out daily, carrying out practice in reconnaissance work on Avros and M. Farmans. Capt. Mellor had an accident on a M. Farman at Folkestone, and broke a rib. He is progressing satisfactorily. He, with another officer and a detachment of men has been at Dover for several days on special duty.

Flying Depôt, South Farnborough.—Experiments on BEs. and M. Farmans were continued.

Flying Prohibited over Gibraltar.

AN ordinance has been published, making it an offence for any person to navigate any aircraft over any portion of Gibraltar, except in the service of the King. The punishment for offences is prescribed as imprisonment with or without hard labour for a period of not more than two years or penal servitude up to five years. Officers are given authority to fire at any aircraft which may not obey their signals.

The Cody Memorial Fund.

DURING his recent tours, mainly in the North of England, Mr. Henry Salmet collected, by means of his charge for his autograph, the sum of £25 for the Cody Memorial Fund, and this has been sent to the Aerial League. Meantime the Aerial League has sent on to Mrs. Cody a further sum of £125, making the total sum remitted to her £1,375.

An Armed Naval Biplane.

IN the notes of our correspondent at Eastchurch on page 1194, it will be seen that mention is made of a new biplane built by Messrs. Short Brothers for the Admiralty, which has been tested recently by Mr. Gordon Bell. This machine is designed to carry a quick-firing gun, which together with the operator will be accommodated in the forward part of the *nacelle* of the machine.

The Michelin Cross-Country Prize.

THE Michelin Tyre Co. have notified the Royal Aero Club that they will be pleased to extend the date for the cross-country competition for the £800 prize, which closed on the 15th ult., to November 30th, 1913.

Curtiss Flying Boat at Brighton.

MR. JOHN D. COOPER and Mr. Loftus Bryan are remaining for a short time at Brighton with the Curtiss flying boat. On Thursday and Friday, last week, both Mr. Cooper and Lieut. Porte were out, and the machine behaved excellently. Large crowds gathered on the days mentioned, and a fine exhibition of flying was to be seen for the cost of a car ride or a short walk. Capt. Bass will pilot the machine next week, and it is probable that the 'bus will be removed to Bognor, after an indefinite stay at Brighton. A few days ago, Mr. Cooper was taken up by Mr. Cecil Pashley on his H. Farman, at Shoreham, and enjoyed the trip immensely.

On Monday, Lieut. Porte's new Curtiss machine was christened by Miss Daisy Irving.

The Curtiss Flying Boat in England.

FROM Capt. E. C. Bass we learn that, having purchased a Curtiss flying boat for his own use, he has also now definitely arranged with Mr. Glenn Curtiss to act as his sole agent for Curtiss aeroplanes and engines in Great Britain, being assisted by Lieut. J. C. Porte and Messrs. White and Thompson (repairers), Middleton, Bognor. Temporarily, Capt. Bass, who is open to arrange local seaside agencies, is making his headquarters at the Royal Albion Hotel, Brighton. We wish Capt. Bass every success in his venture, as we understand that his main object is to popularise this branch of flying among sportsmen.

Austro-Daimlers in England.

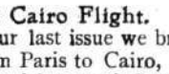
THE Austro-Daimler aero engine, designed by Herr Porsche, has so repeatedly demonstrated its merits that it is not surprising to learn that Messrs. Beardmore and Co., the famous armament manufacturers of Glasgow (who have just received an order from the Government for twenty-four 120 h.p. engines), have secured the exclusive right to manufacture Austro-Daimler engines for aviation purposes in this country.

"Supermarine, Southampton."

SUCH is the telegraphic address just registered by Mr. Pemberton Billing, an excellent title, which he has adopted, as equivalent to the opposite of "Submarine"—and opposed to "Waterplane." It is therefore, appropriate for the new departure which Mr. Pemberton Billing is making, following on the remarkable record in *brevet*-taking which he made recently, in laying down several "Supermarines" at Southampton. We wish Mr. Pemberton Billing every success in his enterprise. His entrance into the aeronautical industry should be helpful, as he is ever original and not afraid of backing his originality. One or two of his new ideas already have the promise of success written across them.

Waterplane Hangars at Brighton.

MR. HARRY PRESTON, who takes an active interest in motoring and yachting affairs at Brighton, is urging the local authorities to put up a permanent hangar on the eastern end of the front with a view to making Brighton a centre for the flying of seaplanes and flying boats.



Paris to Cairo Flight.

IN our last issue we briefly referred to the start of Daucourt's flight from Paris to Cairo, with its unforeseen stop at Sens. On Thursday of last week Daucourt and his passenger restarted from this point, and after a stop of three and a half hours at Belfort they reached Ebnat about forty miles from Schaffhausen. On Saturday further progress was made to Biberbruecke near Ramsen, where engine trouble again caused delay. Another portion of the journey was made on Tuesday, when Daucourt and his companion, Roux, arrived at Augsburg in Bavaria.

The French National Subscription.

THE accounts of the National Fund for Military Aviation in France, which have just been published, show that the total amount raised was 6,114,856 francs (£244,000). At a total cost of £128,000, 198 machines have been purchased and ten more are to be obtained, and on the arrangement of flying stations in various parts of the country, a sum of £80,000 has been, or is, being spent while the training of pilots has cost just on £17,000. A sum of over £10,000 has been disbursed in encouraging inventions for increasing the security of machines in the air.

Prohibited Areas in Austria and Russia.

THE Governments of Austria and Russia, following the action of Great Britain and Germany, have issued orders prohibiting flying over certain areas. With regard to Russia flying is prohibited over the region between 23° and 25° of longitude east and 50° 10′ and 60° 10′ latitude north, which takes in the Russian ports on the Baltic Sea. In Austria the prohibited areas are in Galicia, the Tyrol and Dalmatia.

FOREIGN AVIATION NEWS.

Vedrines at Nancy.

ON a Blériot machine, Jules Vedrines, on the 25th ult., set out from Buc at 9.5 and at 4.30 in the afternoon he arrived at Nancy. He had intended making some long flights in Eastern France, but on arrival at Nancy he found his machine was taken charge of by the police and the pilot was forbidden to start again. It transpired that Vedrines had transgressed the regulations by flying over a prohibited area without first obtaining a permit from the military authorities. He, however, on Wednesday was given permission to fly.

A Long Flight by E. Vedrines.

HAVING an engagement to fly at a meeting at Luxemburg, Emile Vedrines, on his 60 h.p. Rhone Ponnier monoplane, on Saturday flew from Rheims to Luxemburg in an hour and a half.

Helen Competing for Michelin Cup.

FLYING for the International Michelen prize, Helen on his 80 h.p. Nieuport covered five rounds of a 106·5 kilom. course between Etampes and Cercottes near Orleans, on the 22nd ult. He continued to do a similar performance regularly each day, up to Tuesday, on which day a slight mishap ended the attempt before the completion of the fifth lap. Helen's total record was 3,676·8 kiloms. To beat Fourny's record of 15,989 kiloms. he would have needed to fly for 31 days.

The Michelin Target Prizes.

THE official result of the recent tests for the Michelin target prizes has just been announced. Lieut. Varin, who placed 13 out of 15 projectiles, was awarded the first prize of 30,000 francs. Capt. Leclerc and the Marquis de Lareinty-Tholozan, who each placed 7 projectiles, were bracketed second, each receiving 6,250 francs, while Gaubert was fourth with 6 projectiles, and won 3,000 francs.

A Farman Superior Pilot.

ON the 23rd ult. Marcel Gressard made another flight for a superior *brevet*, flying on his Farman biplane, the 150 kiloms. from Etampes to Mailly Camp.

1,200 Kiloms. on a Caudron.

IN seven non-stop stages Capt. Gerard a few days ago completed a fine flight round France on a Caudron machine. His stages were Crotoy, Etampes, Troyes, Nancy, Longwy, Verdun, Rheims and then back to Crotoy.

Mme. de Laroche Practising.

MME. DE LAROCHE is still busy practising at Mourmelon on her 80 h.p. Henry Farman, in view of her proposal to make another attempt for the Coupe Femina. On the afternoon of the 23rd ult. she made one flight of an hour and a half duration.

A New Blériot Waterplane.

LAST week Perreyon was testing on the Seine near St. Cloud bridge, a new Blériot waterplane which has its floats attached in such a way as to embody the elastic qualities of the chassis employed on the ordinary land machine.

A Joy Ride for Garros.

ON his Rhone-Morane, Gilbert, on the 23rd ult., took Garros from Villacoublay to Chevilly, where the latter's machine had been left. Later the two aviators returned in company to Paris, each flying his own machine.

Gilbert Flies Round Paris.

ON his Deperdussin monocoque, which has a 160 h.p. Rhone motor and Chauvière propeller, Gilbert, on Monday, succeeded in flying round Paris and winning first place in the competition for the Deutsch prize, which closed on the 31st ult. Setting out from Villacoublay, he passed over the official starting place at St. Germain-en-Laye, and passing over Senlis, Meaux and Melun, he returned over St. Germain, his time for the circuit of 200 kiloms. being 1 h. 13 m. 25⅘ s., so that his average speed was 163·450 k.p.h.

On Saturday he made an unsuccessful attempt. Leaving Villacoublay at five minutes to five, he flew over the official starting place at St. Germain-en-Laye, but he could not complete the circuit before it became too dark to see, and so gave up at Luzarches. In a high wind on Sunday Gilbert flew the 40 kiloms. to Villacoublay in a quarter of an hour, the speed working out to 100 kiloms. an hour.

Chevillard's Scandinavian Tour.

QUITE one of the best series of prearranged flights which have been made was that completed by Chevillard in his tour of Denmark, Norway and Sweden. The task Chevillard set himself was to fly for three weeks, covering nearly 2,000 miles, and giving over 30 hours of exhibition flights, which meant a flight or exhibition nearly every day. This, in a country cut up by lakes, woods and mountains, often necessitated a flight of over 60 miles without the possibility of landing—no mean performance. Moreover, it was decreed that the flight should take place under military conditions, that is to say, that he should carry a passenger, who in this case was Capt. Sundstet. Further, that he should carry petrol for four hours' flying, and certain spare parts; and added to this were two heavy dressing cases, the total weight being equal to about 600 lbs.

Leaving Copenhagen on September 14th, Chevillard carried out his programme day by day without the slightest accident or delay, and it must be remembered that the weather was anything but favourable. He had continually to travel through thick fogs, flying entirely by the compass often at a height of 6,000 ft., in order to clear the mountains.

A Fatal Accident at Rheims.

WHILE flying a monoplane at Rheims, on Tuesday, Sergeant Canal fell from a height of 100 metres and was instantly killed.

Another Long German Flight.

STARTING from Gotha very early on the morning of the 21st ult., Schlegel on an Etrich monoplane, flew with a passenger to Mulhausen and back, a distance of about 550 kiloms., arriving back at Gotha at 6 a.m. His next stage was to Johannisthal, and from there to Koenigsburg. He then started for Intsterburg, but lost his way over the Baltic Sea in the mist, and eventually came down at Labian. Unfortunately he made a bad landing, and the machine turned over. The pilot injured his nose, while the passenger escaped with severe bruises. In the 19 hours from the commencement of his flight, Schlegel covered 1,470 kiloms.

The German 24 hour Prize.

THE German Aerial League has declined to award the prize for the longest flight in 24 hours on a German machine to Victor Stoeffler, as it is stated that to qualify for the prize the flight should have been made in a straight line from point to point.

Pegoud at Berlin.

ON Saturday and Sunday, Pegoud was flying at Johannisthal, and the performance served to attract to the aerodrome the largest crowd, about 100,000, which has yet been seen there. The pilot each day gave a similar display to that seen at Brooklands. Among those present were the Grand Duke of Mecklenburg Schwerin, Prince Frederick Leopold of Prussia, Prince Frederick of Mecklenburg and Prince Henry XXXII of Reuss, as well as the Minister of War and several principal Army and Navy officers. The Zeppelin liner "Hansa" cruised over the aerodrome while Pegoud was making one of his flights on Saturday. During the performance on Sunday afternoon, one loop was made at a distance of less than 60 metres from the ground.

A Bismarck Pilot.

PRINCE OTTO VON BISMARCK, a grandson of the Iron Chancellor, is now taking lessons in aviation at a school in Mecklenburg.

A Berlin to Paris Attempt.

LEAVING Johannisthal at six minutes to one on the morning of the 21st ult., with the intention of piloting his Jeannin Taube to Paris, Noelle was obliged to land near Hanover. In coming down he smashed his machine, had both his arms broken, and also sustained injury to his face.

Brussels to Berlin Flight.

LAST Saturday, Lanser, after being detained for five days just by Dusseldorf, completed his flight from Brussels to Berlin and landed at Johannisthal in the afternoon.

Cross-Country Flying in Germany.

ON Monday, Friedrichs left Gelsenkirchen at 8.28 a.m., and arrived at Johannisthal at 12.25. Twenty minutes later he started off again, intending to fly to Russia. Ernest Stoeffler, brother of the pilot who made such a fine 24-hour flight the other day, started from Johannisthal with a passenger, on Monday, with the intention of flying to Paris. He, however, gave up on reaching Cologne.

Landing on Mont Cenis.

ON a Nieuport-Gnome monoplane, Major Piazza started from the Mirafiori aerodrome, near Turin, on the 21st ult., and after flying above the Alps landed on the summit of Mont Cenis, 2,300 metres high, just by the French Customs House. The next morning he started off again, and after an hour's flight landed safely at Mirafiori.

Flying Over Mountains.

LIEUT. MAGNIN, on a biplane, and accompanied by a passenger, on the 21st ult., for the first time flew over the Beni-Snassen mountains. He flew over Ain-Safra, Taforalt, Berkana and Martimprey, returning to his starting place by the Guerbous Pass. The most difficult part of the trip was at Taforalt, which is 1,100 metres high.

Models

Edited by V. E. JOHNSON, M.A.

The Problem of the Ornithopter.

(*Continued from page* 1182.)

ASSUMING that some form of springs are employed, they must obviously be so chosen as to give the correct number of oscillations (up and down strokes) per minute (when actuated by a suitable motor) under their proper tension, and the right amplitude.

In different flying creatures, both the number of strokes per minute and their amplitude vary greatly. As to amplitude this varies greatly even in the same creature; it is probably a fair assumption to make that it shall not be less than 30°.

The Size of the Wings.

According to Major Moore, an ordinary flying fox does not usually carry more than 1 lb. to the square foot. According to Chanute, for different species of flying animals, the amount varies from ½ lb. to 2¼ lbs. per sq. ft. For the greater proportionate weights supported it will always be found that the wings are long and narrow. The greater length of wing for the same number of flaps obviously causes the wing tips to travel through a longer space in the same time. For instance, the tip of a wing twice as long as another would have double the velocity. But the air pressure caused by an oscillating wing tip varies with the square of the velocity—which means, if one wing were 1 ft. long and the other 2 ft. the velocities are as 1 to 2, but the air pressures as 1 to 4. Disregarding the extra air resistance, the longer wing would carry four times the load per sq. ft. of its spread that the short one would do, but

Constructional Details

would in all probability put a stop to any great increase in wing length. In the case of any wing flapping machine otherwise than a comparatively speaking small model, the increased weight for the relatively greater strength of the wings (as opposed to fixed aeroplane surfaces) to resist the constantly recurring reversals of strains and stresses due to the alternating motions of all wing devices, appears to be the most formidable drawback to overcome.

In fact this one difficulty alone appears to preclude a successful full-sized ornithopter (at present at any rate) in which the whole wing flapped, *i.e.*, a genuine ornithopter. It does not, however, preclude the successful production of model ornithopters from a careful study of which much would undoubtedly be learnt.

It is probably more difficult to leave level ground in calm air with an ornithopter (model or otherwise) than with a machine of the aeroplane type; its mechanism also is more complicated and it would, at first at any rate, be more liable to breakages.

The shorter the wing for any particular load the better, since this reduces the leverage; but on the other hand the smaller they are the greater must be the driving force to obtain the necessary increased sustaining pressure per sq. ft. area of wing.

The Importance of Speed in Wing Flapping.

To obtain a lifting effect from the air—the rate per minute at which the wings are flapped or oscillated up and down is of greater importance than the actual extent of the surface that is made use of. If we double the speed or rate of flapping, the lift will be between three and four times as great, whereas if the surface be doubled the lift would only be twice as great, the wing span being the same in both cases.

How the Air Lifts—Inertia.

In wing flapping flight the air acts as an abutment for the wings during the time that they exert a lifting leverage on the machine (otherwise than the wings) in an upward direction. Under ordinary circumstances still air can of course support nothing of a greater weight than itself; but like all other bodies, since it has weight it has also *inertia*, and is therefore capable of offering resistance to any change of either rest or motion. Thus in any case where the load and the reaction are equal and opposite the air can always be considered as acting as if it were a solid support.

The Down and Up Stroke.

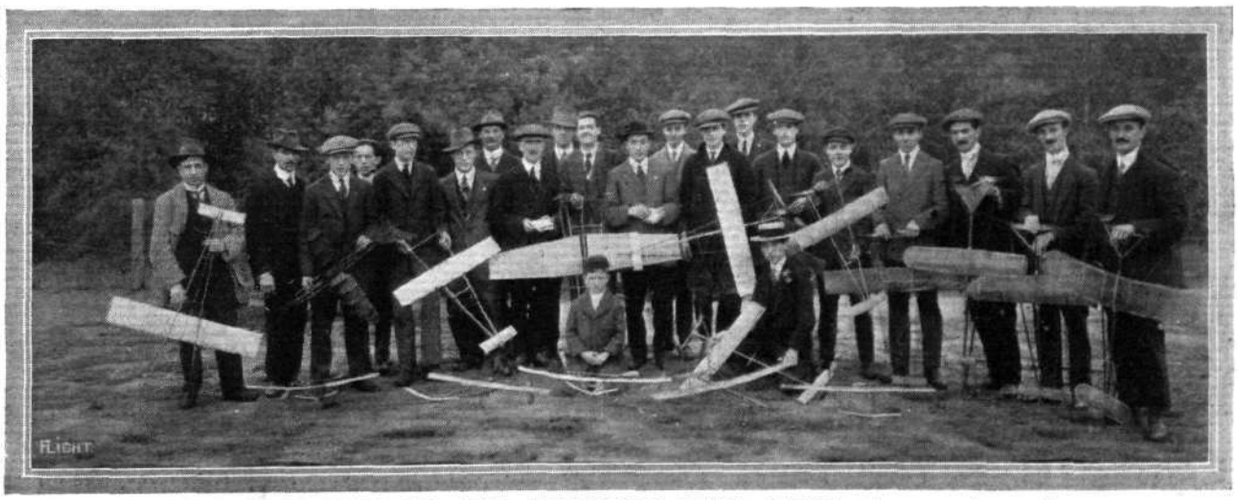
A certain time or period is occupied during the down stroke of a wing and a certain *different* period for the up stroke; according to Marey the former is to the latter as 5 to 3. The first period is essentially the more active one during which the wing lifts, the second the more passive one, during which the wing acts chiefly as an aeroplane surface supporting the weight.

The natural conformation of a bird's wing, with its thick leading and flexible trailing edge, clearly shows that the posterior or rear portion must be tilted upwards by the pressure of the air during the down stroke, and this, moreover, in a manner proportionate to the speed. It must therefore become temporarily deformed into a warped surface resembling the blade of a propeller, and act as such. Like, as it were, the two outer halves of the two propellers on an A-frame twin propeller model aeroplane. From such an action propulsion must follow, while at the same time the wings serve to sustain the weight, the two functions being performed simultaneously. During the up stroke, the rear edge of the wings becomes tilted or inclined downwards—thereby presenting an increased angle of incidence and thus still obtains support from the re-action due to forward motion — moreover, we shall still be obtaining a propulsive effort forwards from our twin-half propellers which have now reversed both their pitch and direction.

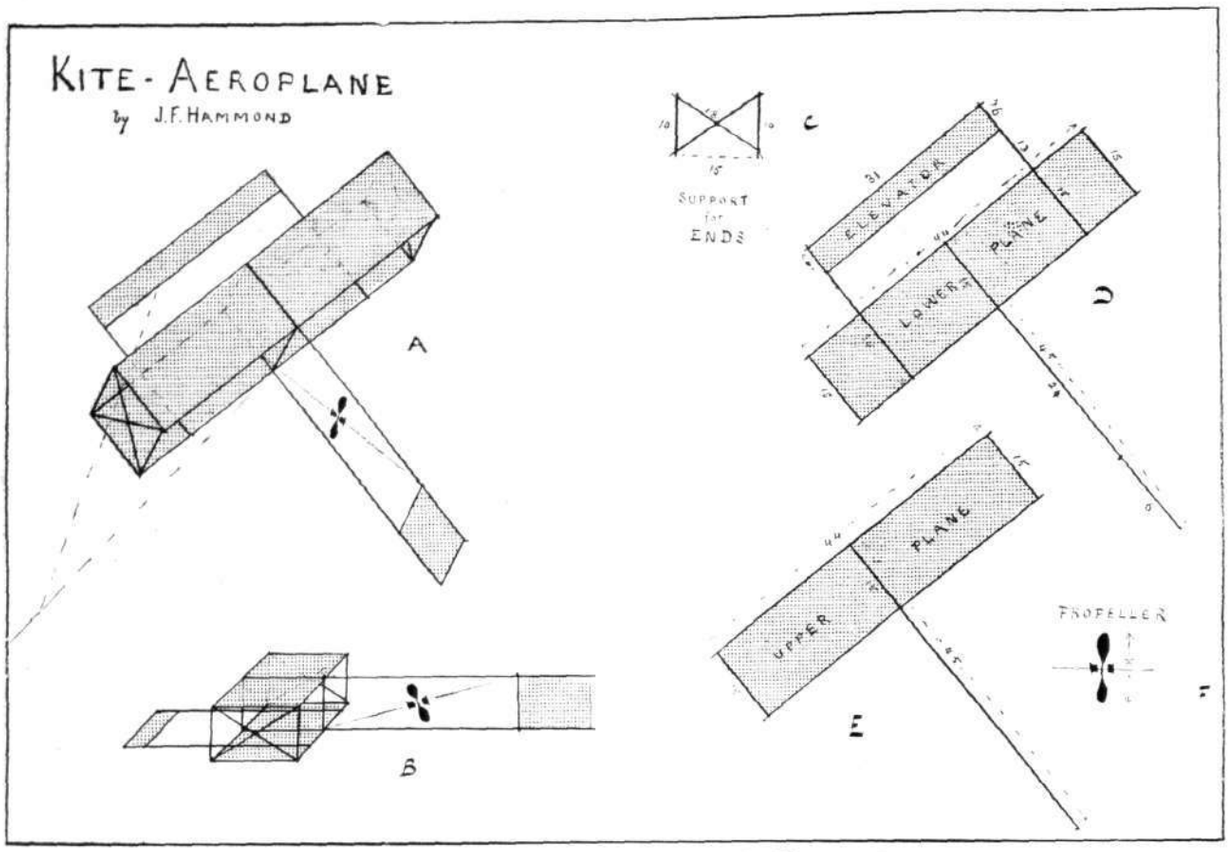
Therefore, if we take a pair of simple artificial flapping wings with a rigid leading and flexible trailing edge, and give it a simple up-and-down motion, we shall obtain a propulsive power at both strokes, since it acts as a propeller would do, if it were oscillated instead of rotated—its pitch being supposed alternately right- and left-handed or *vice versa*.

It is obvious that the wing should move quickly downwards so as to catch the air, as it were, before it can escape and not give it time to set up streamline flow, which always means a tending towards minimum resistance. In next week's issue we propose giving some particulars and drawings of a model helicopter on the foregoing lines, which has met with some measure of success.

(*To be continued.*)



THE LEYTONSTONE AND DISTRICT AERO CLUB.—A meet of members.



A kite-aeroplane designed by Mr. J. F. Hammond.

A Kite-Aeroplane. By J. F. HAMMOND.

In the not far distant future, the most speedy and popular means of transit will be by means of aeroplanes, which will no doubt be made to travel as immune from risks of disaster as we do at the present moment on railway lines and the high seas.

But not fifty per cent. of the people who see an aeroplane cleaving through the air realise that the machine is nothing more or less than a "kite" supported in the atmosphere by an air-wave of its own creating.

The accompanying drawings of a "kite-aeroplane" will tend to illustrate this statement, and the model, which can be made at the cost of a few shillings only, will have every appearance of an aeroplane in full flight, the illusion being intensified by the appearance of the whirling propeller, which is, of course, only blown round by the wind.

Materials.—1 doz. 5 ft. bamboo canes; 2 doz. 3 in. metal skewers the points should be nipped off); 3 yds. material (cotton or silk); 1d. Beeswax; Manilla twine (medium); 1d. carpet thread; 2d. white tape, No. 10.

Directions for making.—All measurements are from *hole to hole*, which must be drilled without splitting the canes.

I. Make the two supports for side ends. Pins to be pushed through the holes (including the centre of the crosspieces) and bound together tightly. Figure C.

II. Cut out material for both planes, allowing turnover for front and back edge to be bound by No. 10 tape, which permits the two sticks of 44 ins. to be run through them. Note it is advisable not to make the width of the material quite the full 15 ins., but, say 14½ ins., to allow for stretching when trying on later. There are no side sticks for the planes.

III. Cut out and make elevator in similar style, but only the front edge requires a stick.

IV. Fix on the side sticks to elevator, then lay them on the lower plane, having previously bored the holes at 6 + 13 + 15 = 34 and pin and bind them down.

V. Add stick for rudder-tail support to lower plane 15 + 24 + 6 = 45. Figure D.

VI. Add stick for rudder-tail support to upper plane 15 + 24 + 6 = 45, which has but 3 sticks. Figure E.

VII. Join the two planes together by tying them on to the "support for ends." Figure C. These must be bound only, and not pinned.

VIII. Pin two sticks (10 inches) to support the centres of the planes (back and front edge), and pin a third stick (10 inches) in front of the rudder.

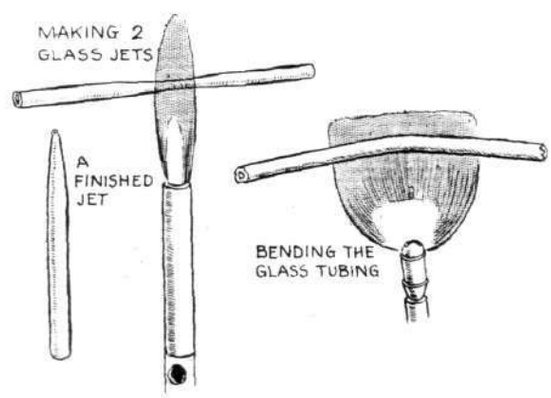
IX. Cut out and sew on material for rudder 10 × 6.

X. The propeller is made with a flat piece of wood, twisted by holding in front of a steaming kettle. A wooden cotton-reel halved and placed each side of propeller, and a long hair-pin run through and turned up in a hook each end does well.

XI. If the lower and upper opposite "corners" of the planes are joined by double string it adds greatly to the firmness of the whole structure.

An Apparatus for Recording Air-Flow Round Solid Bodies. By H. R. KERRUISH.

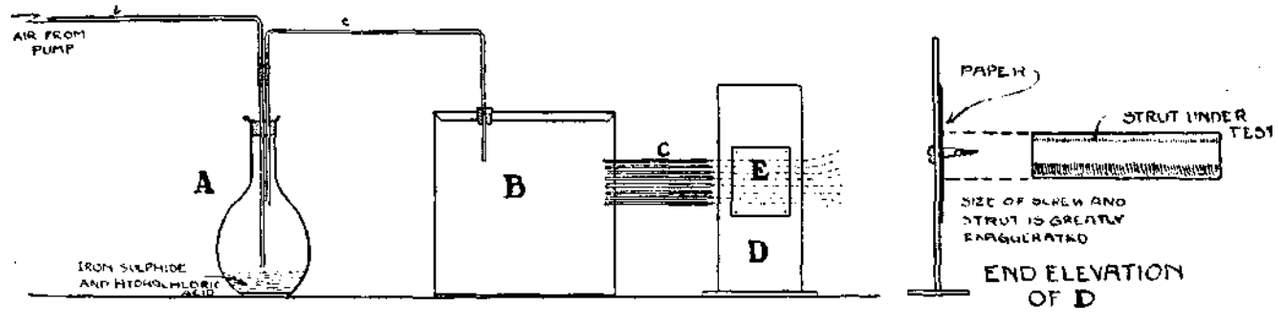
The action of the apparatus is as follows: Air is forced through the glass tube (*b*) from an aspirator or air-pump and passes through the flask, A, in which are the materials for producing sulphuretted hydrogen. A mixture of air and H_2S then passes into chamber, B, through the eight glass tubes, C, which are made parallel at the ends and drawn out into jets. D is a wooden stand, with a piece of paper, E, which has been soaked in a solution of acetate of lead. The jets (which are ¼ in. apart at the points) are adjusted so as to deliver eight parallel columns of air along the surface of the paper,



or, rather, about 2 mm. above it. Now, H_2S (sulphuretted hydrogen), as is well known, produces a black precipitate of PbS (lead sulphide) when in contact with soluble Pb (lead salts), so that if the air supply is turned on, eight parallel black lines will appear on the paper (which must be *damp*), representing the uninterrupted air flow. Now, if a strut is screwed to the board, the screw passing

through the paper, the flow round the section and the eddies produced, if any, will be shown clearly. The operation should only take a few seconds, and if the paper is removed and allowed to dry, it will furnish an indelible record of the flow, the strut section being marked in pencil.

So much for the mode of operation; now for constructional details. Half a pound of glass tubing, ¼ in. outside diameter, will be required, costing about 8*d*. A florence flask is fitted with a cork, in which is bored two holes and glass tubes fitted, as in sketch. The tubes can be bent by holding them in a bats-wing gas-flame until softened, and gradually bending round. The tube (*c*) passes through a cork into the chamber, B, which in my apparatus is composed of an empty 2 lb. tin of Lyle's golden syrup. In one side of this are bored eight ¼ in. holes, which all but touch. The tubes, C, which are exaggerated in sketch, are about 4 ins. long.



The jets should be drawn out in bats-wing flame, as in drawing, and then the end carefully rounded off in the flame. The aperture should be extremely minute. Any text-book on chemistry will give fuller particulars on glass bending to those not very conversant with it. The tubes are then firmly puttied into the holes. The wooden stand, D, needs no further description. The paper, E, should measure some 5 × 4 ins., and should be attached to the wooden stand by means of paste round its edges, care being taken to see that it lies flat on the stand. The particular apparatus used to force air through the apparatus must be left to individual choice. Personally, I used an aspirator such as is used in ordinary chemical laboratory practice. The chemicals to be purchased are ferrous sulphide, hydrochloric acid and lead acetate. The hydrochloric acid should be slightly diluted, and placed in the flask, A, with some ferrous sulphide. The flask should be slightly warmed before starting the experiment, when sulphuretted hydrogen will be given off freely. Now this gas possesses a most vile and penetrating odour, with the result that if this experiment be performed indoors immediate ejection by the mistress thereof is sure to follow when the gas begins to diffuse; it is best to perform it in the open. The preparation of the paper merely consists in soaking it in a fairly strong solution of lead acetate and using it whilst damp. Lead acetate solution is poisonous, and should not be mixed in domestic vessels.

A Correction.

The model scale Caudron biplane which was described and illustrated in October 18th issue as the work of Mr. C. Desoutter, was, we now learn, the joint work of Mr. D. Hiscox and Mr. C. Desoutter, the machine being the work of the former, and the power plant of the latter. We much regret the omission of Mr. Hiscox's name; but where any piece of work is a joint production, it cannot be made too clear what part each has played in the production thereof.

The Leytonstone and District Aero Club.

This club was founded on October 1st, 1912, with 5 members, and has increased so rapidly that the membership is now over 50. At the Olympia Show last February, it exhibited 8 models. At the recent *Model Engineer* Exhibition, the club showed 13 models, including 1 weight lifter by Mr. J. E. Louch; 2 tractors by Messrs. S. Chapman and G. Hawthorn and 10 r.o.g. models. One member, Mr. Louch, holds three British records, and another, Mr. H. Bedford, one ditto. Several members at the present time are working at power-driven models. The club is affiliated to the K. and M.A.A. Mr. F. Handley Page is the president. As a proof that the number 13 is not always an unlucky one, this club was successful on Saturday last at the Hendon Aerodrome in winning the inter-club contest between the clubs which exhibited at the *Model Engineer* Exhibition, thereby gaining the silver medals presented by Mr. F. K. McClean for the best aggregate of marks obtained by the first six competitors of any one team.

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KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Twin screw, hand-launched	Distance ...	R. Lucas	590 yards.
	Duration ...	A. F. Houlberg ...	129 secs.
Single screw, do.	Duration	H. Bedford ...	49 secs.
Twin screw, rise off ground	Distance ...	L. H. Slatter ...	365 yards.
	Duration ...	J. E. Louch ..	2 mins. 49 secs.
Single-tractor screw, hand-launched	Distance ...	C. C. Dutton .	266 yards.
	Duration ...	J. E. Louch ...	68 secs
Do., off-ground	Distance ...	C. C. Dutton ...	190 yards.
	Duration ...	J. E. Louch ..	45 secs.
Single screw hydro., off-water	Duration ...	L. H. Slatter ...	35 secs.
Single-tractor, do., do. ...	Duration ...	C. C. Dutton ...	29 secs.
Twin screw, do., do. ...	Duration ...	L. H. Slatter ...	60 secs.

"Model Engineer" Exhibition Flying Trials.—The flying trials in the power-driven r.o.g. and weight-carrying trials took place at the London Aerodrome, on Saturday, 25th, by kind permission of the Grahame-White Co. Although not an ideal day there was some good flying. The results were as follows: R.o.g. competition—

1. J. E. Louch (Leytonstone Ae. Club), 183 marks, Silver *Model Engineer* Medal.
2. F. Wilkinson (Wimbledon ,,), 157 ,, Bronze ,, ,,
3. L. H. Slatter(,, ,,), 141 ,, 1st class ,, Diploma.
4. H. G. Bond (Leytonstone ,,), 134 ,, 2nd ,, ,, ,,

Power-driven models: D. Hiscox, Bronze *Model Engineer* Medal. No awards were made in the weight-carrying contest, as no model flew the minimum time. The hydro. trials were held at the Welsh Harp in the afternoon, the results being: 1st, L. H. Slatter, Silver *Model Engineer* Medal; 2nd, W. J. Williams, First Class *Model Engineer* Diploma; 3rd, F. W. Jannaway, Second Class *Model Engineer* Diploma.

The team contest for the handsome medals, presented by Mr. F. K. McClean, was as follows:—

R.O.G. Contest.

Leytonstone Ae. Club.					Wimbledon Ae. Club.					Ae. Models (N. Branch).				
Name.	Design, &c.	Duration.	Stability.	Total.	Name.	Design, &c.	Duration.	Stability.	Total.	Name.	Design, &c.	Duration.	Stability.	Total.
J. E. Louch ...	35	110	38	183	F. Wilkinson ...	26	96	35	157	J. McBirnie ...	34	38	8	80
H. G. Bond ...	36	65	33	134	L. H. Slatter ...	34	69	38	141	*Hydros.*				
S. C. Hersom ...	32	84	22	133	A. F. Houlberg	39	49	28	116	Wimbledon Ae. Club.				
F. E. Grattan ...	27	74	32	133	T. D. C. Chown	27	42	10	79	L. H. Slatter	40	60	40	140
F. H. Hawthorn	32	70	28	130						W. J. Williams	25	35	33	93
H. Bedford ...	26	55	24	105						Ae. Models (N. Branch).				
										H. Weston ...	40	20	11	71

The results show Leytonstone 1st, with 818 marks; Wimbledon 2nd, 726; Aero Models 3rd, 151* (*the full team could not attend to compete). The K. and M.A. Association stood out to give the affiliated clubs a chance to gain the medals, and as an inducement to get a good all-round team contest at Aero Show in March. Should different results appear elsewhere, the hon. sec. admits his error, which he found out on going through after announcing the results. The members of the affiliated clubs wish to convey to the judges their thanks for the way in which they judged. They were: Sir John Shelley, Mr. R. M. Balston, Lieut. T. O'B. Hubbard, Dr. A. P. Thurston; also the following assisted in judging at the flying trials: Messrs. V. E. Johnson and F. Mayer, and Sir John C. Shelley entertained the competitors to tea at the Welsh Harp.

16-oz. Hydro. Contest.—This contest was held after the above competitions at the Welsh Harp, the results being:—1st, L. H. Slatter, Antimony Trophy; and, H. G. Bond, Bronze Medal of the Association. There were eight entries for this competition.

Records.—Mr. L. H. Slatter, during the *Model Engineer* trials, raised the record from 45 to 60 secs.

Inter-Club Contest.—Mr. Thomas Farrow, chairman of Farrow's Bank, has given a handsome challenge shield to the Association for competition among the affiliated clubs. The size is to be 36 ins. by 29 ins. It will be exhibited as soon as ready, and will be shown at the Aero Show. Full details will be announced later.

Engine Bench Test.—The results of this will be given in next week's notes.

27, Victory Road, Wimbledon. W. H. AKEHURST Hon. Sec.

AFFILIATED MODEL CLUBS DIARY AND REPORTS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (N. Branch) (25, CHURCH CRESCENT, MUSWELL HILL, N.).

NOVEMBER 1ST, 3 p.m. R.O.G. duration and stability competition (members only) for "Enfield" Challenge Cup. Nov. 2nd, practice, 10 a.m. and 3 p.m. Nov. 6th, committee meeting at above, 7.45 p.m. Nov. 7th, meeting of glider sub-section at the "Cabin" Tea Rooms, High Road, opposite East Finchley Station. Anyone interested in gliding work is cordially invited to attend. Nov. 15th, monthly competition, speed r.o.g.

A special effort to increase the membership is being made, and 15 working members are wanted. Advantages include: Use of private flying ground, library and information bureau, frequent competitions for varied types of machines, weekly indoor meetings (refreshments provided), with discussions, lantern lectures, &c. A club shed will shortly be put up on the flying ground. For further particulars please communicate with the secretary at the above address.

Monthly Report.—At the *Model Engineer* Exhibition four machines were shown in Class IV r.o.g.: Messrs. McBirnie, Bond and Hindsley in loan section; hydro, Mr. H. R. Weston. A deciding match against the Paddington Club at Sudbury was flown off on the 11th (duration, r.o.g.), the times being—Paddington: Mr. Dutton, 89 secs.; Bird, 59⅘ secs.; Driver, 53⅘ secs.; Johnson, 53 secs.; average, 63 1/10 secs. A.M.A.: Mr. Bond, 62⅜ secs.; Hindsley, 59 secs.; Claflin, 46½ secs.; Coleman, 42 secs.; average, 52¼ secs. Social meetings were held on the 9th and 23rd, when the scheme for a glider sub-section was launched, also it was decided to put up a trophy to be competed for quarterly. The first quarter's competition to end of December will be for tractor duration. Attempts may be made any Saturday or Sunday. Also a scheme was brought forward for putting up a shed on the flying ground to enable members to try their machines and make small repairs during the winter in comparative comfort. This will be carried out as soon as the membership warrants it. The following members have been flying models as under:—W. E. Knight, 24 in. tractor, 30 ins. span, average 25 secs. duration, and r.o.g., 1-1-0-P2, A frame, 36 ins. long, 30 ins. span, 10 ins laminated propellers, weight 7 ozs., durations 50-60 secs. O. Root, fast tractor, average duration 25 secs., 24 ins. span, 30 ins. long, 10 ins. carved propellers. R. L. Rogers, 14 oz. hydro-biplane, 36 ins. and 26 ins. span, type 1-2-0-P2, 12 ins. propellers, gets off easily, one float front and two behind. F. G. Hindsley, 5½ ozs., 42 ins. hollow spar, with 36 ins. by 5 ins., 30 ins. by 4 ins. and 33 ins. by 4½ ins. planes, with the last of which it went through the *Model Engineer* Exhibition, type 0-1-1-P2, 11½ ins. carved G.H. propellers, 71 secs. hand-launched, and 78 secs. r.o.g. (club record), also 33 ins. by 20 ins. speed (r.o.g.) model, loading 14 ozs. to the sq. ft.; A 0-1-1-P1. T. W. Dunn, 1-1-0-P2, A frame, 36 ins. by 30 ins. span, 12 ins. bent propellers, with 11½ ins. G.H. propellers 55 secs. very high, with 12 ins. laminated propellers about 50 secs., with 10 ins. centrales 45 secs., r.o.g., also small tractor. S. F. Bond, r.o.g. 1-1-0-P2, 7 ozs. weight, 42 ins. h. spar, 30 ins. span, 11 ins. carved propellers on 1¾ oz. elastic (in *M. E.* E.); 40 ins. h. spar, 5 ozs., 1-1-0-P2, 36 ins. plane, 11 ins. propellers, 69 secs. r.o.g., and twin-gear 6 oz. tractor, 36 ins. span, 42 ins. h. spar, 42 secs., h.l., on first trials. C. C. Claflin, twin-gear 36 ins. by 28 ins. span tractor, 0-1-1-P2, speed model (25 m.p.h. approx.); 39 ins. by 36 ins., h. spar, 0-1-1-P2; 6 oz. 0-1-1-P2 twin-gears, 30 ins. span, 40 secs.; ditto, without gears, 46 secs., r.o.g.: 4⅜ oz. 1-1-0-P2, 11 ins. carved, 59 secs. h.l., 55 secs. r.o.g., and 39 ins. by 30 ins., 4½ oz., h. spar, 1-1-0-P2, 61 secs., r.o.g. E. Coleman, "Star," 6 oz. 1-1-0-P2, 10 ins. propellers, 52 secs., r.o.g.

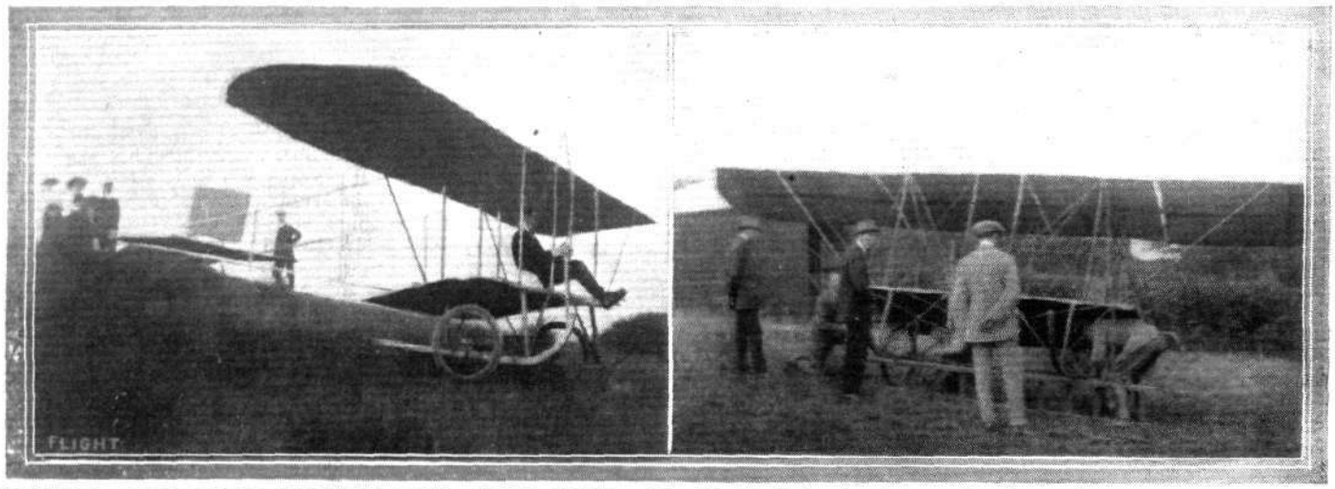
Bristol and West of England Aero Club (Model Section) (42, ROYAL YORK CRESCENT, CLIFTON, BRISTOL).

Monthly Report.—Sept. 6th, a model flying meeting was held at the Sea Walls. Mr. Smallcombe obtained 38 secs with twin-screw hand-launched model, fitted with a wing of original design, and having a heavy camber at the middle, damping out entirely at the tips, there being, however, *no dihedral angle.* The lateral stability was certainly rather better than that of other twin-screw models with the wings of a constant camber. A flight, Mr. Martin's, with self-rising model, got 27 secs., and Messrs. Howse and Gordon Stephens, 31 and 27 secs. Sept. 13th, Mr. Edgar's "Caudron" type glider was tested again at Portbury, when one or two short free glides were made by Mr. R. M. Haines. Mr. Edgar's machine is evidently undersurfaced for gliding, but given another 100 sq. ft. of surface, there is no reason why as good glides should not be made with it as have been made by a machine of very similar design, illustrated on page 1144 of FLIGHT, Vol. V. Mr. Edgar's glider was described on page 996 of FLIGHT, Vol. V. The autumn model flying contest was held on Durdham Downs, Oct. 4th, in showers of rain. The events were as follows: A, rising from the ground and weight-carrying duration contest; B, ornithopter and helicopter contest; C, contest for "aeroplanes carrying no forward elevator or tail"; D, hand-launched duration contest. Event A, first and second prizes were divided between Messrs. R. T. Howse and E. Martin, equal first with 30 secs. (carrying a weight). Event B was postponed. Event C was keenly contested, but none of the competing flights were of the minimum duration. The competition in Event D was very keen, and the event was only decided on the stroke of the time limit. The awards were:—1. Mr. W. A. Smallcombe, 44 secs.; 2. Mr. R. C. Cross (Bath and Som. Aero Club), 41. Twenty models out of the number entered actually competed, and the flying, considering the weather conditions, was remarkably good. The events were judged by Mr. P. A. Thompson (hon. sec. of the Aero Club) and Messrs. R. Grainger Brunt, H. Dobree Leupold, and M. Luby acted as timekeepers; and Messrs. R. M. Haines (assistant hon. sec. of the model section) and R. V. Tivy (hon. sec.) as stewards.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).

NOVEMBER 2ND, at 10 a.m. Model flying, as usual, near Sand Hills.

Monthly Report.—Oct. 5th, in heavy rain, duration competition, off ground (10 entries), for prizes given by Mr. Thos. Kimpton. Mr. H. Bedford secured first place with 53⅜ secs. Messrs. W. Hersom and F. Hawthorn tied with 52⅝ secs. In the "fly off," Mr. W. Hersom did 69 secs., thus securing second place, and really beating Mr. Bedford's 53⅜ secs. Mr. F. Hawthorn was third with 52⅝ secs. Mr. H. Green got 51 secs. Judges—Messrs. C. J. Gardiner and H. G. Bond. Mr. G. Hawthorn was out with his Handley Page wing tractor, but its performances were limited to glides, as it was minus its propeller. Mr. F. Woods put up some spectacular flights with his r.o.g., and others flying were Messrs. F. Kimpton, F. E. Grattan, C. Hersom and A. Hoare. Oct. 8th, Second annual general meeting, when the Treasurer reported the club to be in a sound financial condition. The club now has a membership of over 50. At the *Model Engineer* Exhibition, this club accounted for a quarter of the total aeroplane exhibits. Thirteen models were exhibited, 2 single tractors, one single-screw weight lifter, and 10 twin-screw r.o.gs. In the flying tests in connection with this Exhibition, 11 of these models were flown. Mr. J. E. Louch secured first place with 110 secs., and incidentally the *Model Engineer* silver medal. Mr. H. G. Bond obtained a diploma of merit. His duration was only 65 secs., so he must have scored well for construction. He exhibited a skeleton model, very highly finished. The Club prize of six silver medals, presented by Mr. F. K. McClean, was won by this club, the team and results being given in K. and M.A.A. report. Mr. J. E. Louch unfortunately broke the gearing on his single-screw weight lifter, but with a single skein of rubber he obtained some fine steady flights, although he could not reach the required duration. Mr. H. G. Bond represented the club in the K. and M.A.A. 16-oz. Hydro. Competition. His model was of the loaded elevator type, with a hollow spar T-frame, and although it flew rather sluggishly he obtained second place and the K. and M.A.A. bronze medal. Mr. H. Bedford's hydro. has been flying on several occasions during the month, but the chief interest has been r.o.gs. for the Exhibition. Mr. Bedford has also been flying a single-screw behind r.o.g., with which he obtained 63 secs., and on the same date Mr. F. Hawthorn, with a twin, put up 96 secs. On the 26th a few members turned out in a thick fog and flew till rain put an end to things. These were Messrs. H. Pedford, with hand-launched; F. Gratian, with r.o.g.; also single tractor with built up 3-stick *fuselage*, weight 6 ozs., which flys steadily and well; L. McCullock, with r.o.g.; and W. J. Riggs. Mr. G. Hawthorn's tractor is giving a good account of itself, the H.P. wings giving it a graceful appearance and good stability.



BRISTOL AND WEST OF ENGLAND AERO CLUB.—Mr. N. W. Edgar's glider. On the right it is being assembled, a job which occupies about 20 mins.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

Monthly Report.—Members continue to make steady improvement both in model construction and flying, evidence of which the following results go to prove. On Oct. 4th, another open competition was secured by the club, the novices' competition for duration and stability held by the K. and M.A.A. on Wimbledon Common being won by Mr. Robert Bird, who scored 95 marks, Mr. W. Evans was fourth with 80 marks. At home on the same day, Mr. F. W. Johnson secured his 2nd class certificate with a flight of 35 secs. r.o.g. On Oct. 18th the third inter-club contest with the Aero Models Association took place at Sudbury, the home team winning handsomely by an average of over 11 secs. The best times were as follows:—For the Aero Models, Mr. Bond, 62⅝ secs.; Mr. F. G. Hindsley, 59; Mr. Claflin, 46½; Mr. Coleman, 42; average, 52·45. For Paddington, Mr. C. C. Dutton, 89 secs.; Mr. R. Bird, 59⅘; Mr. D. Driver, 53⅜; Mr. F. W. Johnson, 53; average, 63·75. Other r.o.g. durations on the same date were: Mr. F. W. Johnson, 65 secs.; Mr. W. Evans, 62⅜; Mr. R. Bird, 60; Mr. H. Woolley, 58⅜; Mr. D. Driver, 58; Mr. H. Woolley secured his 2nd class certificate and Mr. W. Evans his 1st class certificate, after several previous unsuccessful attempts. On Oct. 25th the r.o.g. competition was won by the secretary. Mr. C. C. Dutton was close up second, and Mr. D. Driver was also close up third. The prizes were values in model materials. All the competitors used new machines. At the *Model Engineer* Exhibition Mr. C. C. Dutton exhibited a model hydro-aeroplane of excellent workmanship.

Reigate, Redhill and District (THE COTTAGE, WOODLANDS AVENUE, REDHILL).

NOV. 1ST, junior members' competition 3 p.m.

Monthly Report.—Members have been busy during the month, most time being put in workshop now the shorter days are coming on. The junior members are preparing for competition on Nov. 1st, an electric torch being offered as first prize for this by Mrs. Neville Meier. There is also 2*s.* 6*d.* worth of accessories and pliers as second and third prizes. Messrs. Bonn and Co. have been kind enough to offer a prize of 10*s.* worth of accessories, and it has been arranged that this is to be won by the member who makes the best duration record with Canard r.o.g. before March 1st, the present record of 45 secs. to be surpassed. The next Rawson Cup Competition has been arranged for Dec. 20th—single-tractor mono. r.o.gs.—duration. Minimum weight, 6 ozs.; loading, 6 oz. to 1 square ft.—three trials. On Oct. 20th the club was invited to a debate, at which the following proposition was put forward: "That the performance of M. Pegoud at Brooklands, and similar exhibitions, in that they serve no useful purpose, should be discontinued." The proposition was defeated by an overwhelming majority, Messrs. Burghope, R. G. Wilson and hon. sec. making speeches in opposition. On Oct. 25th, a lecture took place at headquarters, entitled "The General Theory of Aeroplanes," by Mr. Burghope, and a very enjoyable evening was spent. Mr. Kay has been out with a new tractor mono., also working on lathe, making wheels, &c. Mr. Burghope has been out with his high flying r.o.g. mono., getting over 400 yds. in wind, also 9½-oz. tractor mono. and 9½-oz. Canard biplane, which he is testing with a new camber on planes. Mr. Hoyle has been tuning up competition biplane, using Sutton-type propellers. Mr. Sutton has the honours of the month, having turned out a new type of propeller, which promises to be good. He has had out his 6½-oz. tractor mono., and succeeded in getting it going well in wind about 130 yards after circling, also 2½-oz. h.l. and 4-oz. floating tail h.l., getting 56 secs., had much longer flight previously, but not timed. Mr. Jordan has had from 30 to 35 secs. with 9½-oz. r.o.g. biplane—this has an excellent glide and is very stable in wind. Mr. Hooton has been tuning 7-oz. r.o.g. mono. for competition with over 30 secs. Mr. R. G. Wilson tuning up a tractor biplane with an original type of plane, being deflected, but not so much as the "Dunne-type"—it appears to very stable. Mr. Norton out with 8½-oz. tractor mono. and succeeded in smashing same. Another is now being built embodying new ideas.

Sheffield Aero Club (35, PENRHYN ROAD, SHEFFIELD).

NOV. 1ST, "Colver Cup" competition at Standhouse Aerodrome, Intake (weather permitting), at 3 o'clock, competitors to be at the judges' flag by 2.45 p.m. latest. If weather unsuitable, same place and time Nov. 8th.

Monthly Report.—Sept. 27th, Messrs. G. Askew, R. E. Rayner, and G. H. Dewsnap represented the Sheffield team against the Manchester Model Aero Club, at Manchester, in an r.o.g. duration contest. Sheffield won easily, their total being 205 secs. against Manchester 120. A good deal of interest was taken in the fine construction of the Sheffield team machines. A return match is expected to take place shortly at Sheffield. Oct. 4th, at Standhouse Aerodrome, the club and Sheffield records were raised by Mr. R. E. Rayner's hand-launched machines. 785 yards distance, 100 secs. duration; r.o.g. 621 yards distance and 108 secs. duration. Oct. 11th, records attacked again. Mr. R. E. Rayner's model took a direct course for centre of the city. After travelling half a mile it landed with a splendid *volplané* on the top of a house roof in Manor Lane. Result, 110 secs. duration r.o.g., another record for Mr. Rayner.

Wimbledon and District (165, HOLLAND ROAD, W.).

NOV. 1ST, usual flying in afternoon; evening illuminated flights. Nov. 2nd, flying 10 a.m. and 3 p.m.

Monthly Report.—The weather this month has not been very favourable for models, but a good deal of flying has been done. Several new tractors have been out, and Messrs. F. Tucker, S. Williams, D. Easdale, A. F. Houlberg, D. Laing, F. Whitworth and T. Gregg have flown models of this type. In the K. & M.A.A. competition for tractor models held on Wimbledon Common on Oct. 18th, Mr. Whitworth took 1st place, his best duration being 63 secs., and Mr. Laing 2nd place, best duration 49 secs. In the novices' competition on Oct. 4th, Mr. Chown took 2nd place, best duration 76 secs., and Mr. Powell 3rd. Mr. Connoley has flown his h.l. model on several occasions, surpassing himself with a flight of 78 secs. Mr. Powell has been experimenting with various light hollow spar models, getting very slow flights, and durations up to 95 secs. Mr. Hayden has had out a large size square hollow spar model, which is a very fine flyer. The best flight was one of 107 secs., the model flying at a great height; it is fitted with propellers which "free-wheel" when run out and the glide is greatly improved in consequence. Mr. Wilkinson has had out his light hydro. on the Rushmere, getting off well and making good flights. In the competition for 16-oz. hydros., held at the "Welsh Harp" on the 25th, Mr. L. H. Slatter took 1st place with 40 secs., the machine getting off in fine style and flying very steadily. The club was well represented in the *Model Engineer* Exhibition, there being 10 models shown in all—six in r.o.g. class, two in hydro. class, and two in weight-lifting class. Mr. Slatter showed two of his well-known models, Mr. Houlberg two, and Messrs. Laing, Smith, Wilkinson, Easdale, Williams and Chown one model each. Members did well in the trial flights at Hendon on the 25th, the team taking 2nd place in the inter-club contest. In the r.o.g. class Mr. Wilkinson took 2nd place with his light hollow spar model, loaded elevator type, his best duration being 95 secs.; Mr. Slatter 3rd place. In the hydro. class, Mr. Slatter came 1st with 60 secs., and Mr. Williams 2nd. In the weight-lifting class, Mr. Easdale could not induce his machine to leave the board owing to trouble with his gear.

UNAFFILIATED CLUBS.

Birmingham Aero Club (8, FREDERICK ROAD, EDGBASTON).

NOV. 3RD, monthly meeting at the Colonnade Hotel, New Street, 8 p.m.

Monthly Report.—Interest is now chiefly centred on larger scale machines, including gliders, large kites and land yachts. One of the latter has been constructed by Mr. E. Trykle, designed on the lines of the Blériot land yacht. This has created quite an amount of interest among the members, and under favourable conditions has attained a speed of at least 25 m.p.h. on the grass field. The control of the yacht is quite simple, as after a little practice the best speed can soon be got out of it that is possible under the prevailing conditions. Several kites have also been flown, including a Baden Powell man-lifting kite, kindly given to the club by Dr. Ratcliffe, one of our vice-presidents. The club glider, which was recently damaged in a rather bad landing, is still under repair, but it is hoped it will be ready for service again shortly. Another glider now well under way is being built jointly by Messrs. W. R. Beaumont and C. Pritchard Davis on the club's aerodrome at Billesley. It is of the Wright type, and the outstanding feature is its extreme lightness coupled with the design of details, they being very original. An aeroplane is shortly to be built by the same two members, a 25 h.p. engine being proposed to be fitted. The models have been very interesting the last few weeks, and on one occasion there were only tractors being flown. Mr. G. Baker with his Bakerplane has been getting good durations with his single propeller model, obtaining an average of 60 secs. Mr. G. Crooke Rogers has also obtained 60 secs. duration with a tractor, whilst Messrs. E. Bradley, R. Bibro and B. C. Little have also been flying tractors. Mr. E. Bradley is now noted for the number of models he turns out, which have been averaging lately one a week, whilst Mr. Vale's are noted for their originality. Mr. McManus has also been getting some very good flights with his twin-propeller model. The clubhouse at Billersley has now been improved by the erection of railings round and out some distance from it, making the appearance much better.

Croydon and District Ae.C. (158, HIGH STREET, CROYDON).

Monthly Report.—Following the example set by Mr. Pavely, most of the members have been, and are, busy constructing large models of both tractor and propeller type, and owing to this fact not much flying has been done during October, there being a scarcity of models. However, several tractor monoplanes have been flown by their owners, Messrs. Bell, C. Smither, H. Smither, W. Finnigan, D. Mullins, F. Carter, P. Hart, and D. Pavely, though nothing great has been accomplished with the exception of Mr. Pavely, who with his 20-oz. tractor monoplane obtained a duration of 27 secs. off ground. Mr Bell has had some good distance flights with his tractors. With r.o.g. models, Messrs. Bell Mullins, Horrocks, and C. Smither have had fine flights. At Addington Hills, Mr. C. Smither, who has made an r.o.g. mono. of a very original type, has obtained some tremendous distance flights with both r.o.g. and hand-launched models. Mr. Bell's Henry Farman-type model is nearly ready, and Mr. Pavely, with a hydro-mono. he is constructing, hopes to easily get 80 secs. duration.

Edinburgh Ae.Soc. (Model Section) (41, DRUMSHEUGH GARDENS)

Monthly Report.—At the autumn meeting, on Oct. 4th, there was a large attendance of competitors and the public, representatives from the Glasgow and Dundee clubs being present and taking part in the competitions. The results were: Distance, 1. E. Hardy, 374 yds. Duration, 1. C. Boyd, 47⅘ secs.; 2. D. L. Robertson, 45⅘; 3. J. Donaldson, 43⅕. After tea the competitors and their friends were shown over the hangar containing Mr. Wilson's Caudron and Mr. Cooper's machine.

Liverpool Aero Research Club (62, CEDAR GROVE, LIVERPOOL).

SATURDAY, Nov. 1st, postponed duration competition, Stanley Park, 4 p.m.

Monthly Report.—Although considerable advance can be recorded of the work done in the ordinary model flying section, it is now perfectly clear that the inauguration of the "Research" section is practically an impossibility this year, which is regretted. The meeting held at Stanley Park, Oct. 4th, attracted a considerable crowd, much to members' inconvenience. B. Tear and A. G. Pugh flying the former's twin mono. at dusk, up with light. W. Beale's machine flew well, making a marked contrast to the racers. A. G. Pugh also trying new racer. G. H. Kilshaw out with tractor r.o.g. mono. and twin racer. Oct. 18th, Stanley Park: G. H. Kilshaw's biplane out, grand flights; W. Beale, biplane, some neat flights, small circles; A. G. Pugh and B. Tear flying 1-1-0-P2 at dusk, lighted up. Oct. 25th, Sefton Park: W. Beale, A. G. Pugh, G. H. Kilshaw and B. Tear, an effective display, despite the showers, with the two monos. and biplane. It is to be sincerely hoped that more members will take a hand next month in these demonstrations, otherwise it is little use their being held.

Manchester Model Ae.C. (890, CHESTER ROAD, STRETFORD).

ARRANGEMENTS are now being made for drawing up a programme for the winter, the weekly meetings still continuing until further notice.

Monthly Report.—During past month Mr. Kenworthy, who had a new hollow spar r.o.g., 0-1-1-P2-type out, and has been experimenting with flexible trailing edge and Weiss-type planes; he also has passed his 2nd class tests, and raised the record to 55 secs. Messrs. Broadhurst and Watson have obtained good results with their tractors, the latter doing 37 secs. duration, 3 secs. behind the record. Mr. Watson, on Mr. H. V. Roe's suggestion, flew his Weiss-type tractor upside-down, it flying for about 30 yards, and on another occasion describing a semi-circle. Mr. Monteiro made a welcome reappearance into the club after a few months' absence in Portugal, where he did some excellent flying with his tractor models. He has bought a Slatter hydroplane, and great interest was centred around its trials, which it performed very well, rising and landing in good style. Others flying, Messrs. Jackson, Gilbert, and Huntingdon, r.o.g. and h.-l. machines.

Scottish Ae.S. ("ROCHELLE," LIMESIDE AVENUE, RUTHERGLEN).

NOV. 1ST, hand-launched models and r.o.g., Paisley Racecourse. Nov. 15th, hand-launched models and r.o.g., Kirkintilloch.

Monthly Report.—Oct. 4th, several members visited Edinburgh for the competitions organised by the Edinburgh Aeronautical Society, Model Section. There was a large entry of models, the results being as follows:—Distance: E. Hardy (E.A.S.), 374 yds.; E. Hardy (E.A.S.), 359 yds.; E. Hardy (E.A.S.), 351 yds. Duration: W. Craig Boyd (S.A.S.), 47⅘ secs.; D. L. Robertson (Dundee Ae. Club), 45⅘ secs.; J. Donaldson (S.A.S.), 43⅕ secs. J. C. Balden (S.A.S.) also made new record for twin-screw tractor of 16 secs, Oct. 18th, members at Maxwell Park, for experimental purposes, with hydros. and tractors. As the new session has commenced, the secretary would be pleased to hear from anyone desirous of joining the club. The workshop, at 18, Holland Street, is open on Tuesday, Thursday and Saturday evenings. The subscription is 7*s.* 6*d.* seniors, 4*s.* juniors. The club is again visiting Edinburgh at New Year for an inter-city contest. Eliminating trials will be held early in December for the four places in club team. Members are requested to turn out to the meetings in November so as to allow committee to decide best method of awarding places.

S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

NOV. 11TH, flying Blackheath, Woolwich and Lee, usual times.

Monthly Report.—Despite adverse weather last month, the club's activities have in no way diminished—if anything, they have increased—as the following report will show. Messrs. W. R. Halnan, A. D. Nicholls and F. Plummer have each made fine flights at the London Aerodrome on the Grahame-White Co.'s 80 h.p. Blériot monoplane, under the pilotage of Mr. Walter L. Brock, while the hon. sec. (Mr. A. B. Clark) was, with five other passengers, given a trip in the 120 h.p. "aero char-a-bancs." It has been decided to hold an exhibition of model aeroplanes, &c., next December, at a convenient hall in South-East Croydon, and the owner of the best model or most interesting exhibit—to be decided by voting amongst the visitors—will hold the South-Eastern Trophy for the ensuing three months, as no out-door competitions will be held until the January-March quarter next, when a "stability" contest will take place. This will be on the lines suggested by the club's president, *i.e.*, models will be required to make flights in four different directions, viz., down wind, into the wind, and across the wind in both directions, and fly on that course for a stated time—to be decided later—without any deviation whatever. Now that the unsettled weather is approaching, members, in the opinion of the club, will be well advised to revert to the more reliable "flying sticks," and leave out-door experimenting for a more suitable season. It has been suggested that organised *in-door experiments should be conducted during the winter, and if sufficient* members will support the idea to open a clubroom. The hon. sec. will be glad to have opinions on these points. Several "hollow spar" models have been lately flown, and many others are being built. The largest at present in the club has been constructed by Mr. F. Plummer,

and is a 4-ft. twin-propeller floating tail mono., which, as may be expected, has a very high duration average. A very noticeable feature of this model is the absence of straining wires. He has also flown three other machines—a 1-lb. tractor monoplane (the present holder of the S.E. trophy), scale drawings of which appeared in FLIGHT of Oct. 18th; an enclosed body biplane and a r.o.g.-and-water mono. Mr. Westwood has also been busy with his 1-lb. tractor, now in perfect trim, and has also found time to successfully fly a smaller tractor, with a rather original *fuselage*, and a twin-propeller "single-sticker." A mono., with the plane set at an inverted dihedral has been successfully flown by Mr. G. Brown, and a smaller model, fitted with an orthodox plane, by Mr. E. A. Brunton, who has also been experimenting with a very heavily loaded tractor and a r.o.g.-and-water mono. The 1-lb. gull's-wing tractor of Mr. Chinnery's is still on the active list, but has recently been supplanted by a smaller tractor which repeatedly climbs to a good height, and, after making a very steady flight, generally ending with a splendid glide, lands in perfect style on the chassis. Mr. A. D. Nicholls has flown a similar model, and also a hollow spar tractor and a twin-propeller ¾ oz. biplane. The all-metal mono. constructed by Mr. A. B. Clark has been flying very consistently, several 1 min. flights having been obtained. This model is also an adept at "trick flying," some of the banks and spirals which it does would make even Chevillard stare. Now that Mr. F. Dixson has altered the situation of the wheels on his "A" frame mono., it has made some splendid ½ min. (r.o.g.) flights. This member has also been testing a small (12-in.) tractor. A very determined effort is being made by Mr. F. Evans to induce a scale model Blériot to fly, but up to the present, chiefly owing to "weight-for-area," coupled with a good deal of head resistance, his efforts have not been crowned with success. He has, however, had some very good flights from a twin-propeller "A" frame. Other "A" frames have been flown by Messrs. Jones (fitted with "V"-shaped wings), F. G. Peters (whose mono. was nicknamed "Gordon-Bennett" on account of its speed), S. Hunt (r.o.g.), and C. H. Morgan. The latter has also flown three tractors and one "single-sticker." Mr. Jones has also been experimenting with a hydro. The club is always pleased to welcome visiting aero modellists, but attention is drawn to the fact that all models must be fitted with effective protectors.

Stony Stratford and District Kite and Model Ae.C. (OLD STRATFORD).

NOV. 5TH, meeting at Wolverton. Subject: "The Building of the Model." Nov. 19th, annual general meeting and exhibition of models at Public Hall, Stony Stratford. Flying every Saturday in the Black Horse Field, Old Stratford, 2.30.

Monthly Report.—Oct. 1st, at Wolverton. "Kite Design" was the subject for the evening, being a brief *resumé* of the competing kite in the club's open competition, and faults in construction and design. During the discussion there arose a question regarding the awarding of marks for stability and collapsibility of kites, and a resolution was adopted, as follows: "That for future competitions a basis of 30 and 20 marks be adopted for stability and collapsibility, thus retaining the K. and M.A.A. basis of 100 marks for the four tests." Following a suggestion from a gentleman, a Buckingham branch has been formed, and members have already been enrolled. Oct. 22nd, usual fortnightly meeting at the clubroom at Stony Stratford. The subject was "R.O.G. Models." Amongst the settled features of next year's programme is the introduction of building evenings, to encourage more active work amongst some of the members. Competitions are under discussion, and it is hoped to hold them once a month.

Windsor Model and Gliding Club (10, ALMA RD., WINDSOR).

THE winter session has now commenced, and the weekly lectures should prove popular. Members are advised to get ready for the next Aero Show. A meeting will be held on Wednesday to thoroughly consider the question of building a power machine, as several members are confident of their ability to carry out the work. It has also been decided to try and arrange an exhibition of the club's work. Suggestions are invited from members. A competition for 1 lb. models will shortly be arranged.

Monthly Report.—During past month the club membership has been considerably augmented by some fresh members from Maidenhead, and more effective work will be the result. The winner of last month's competition was Mr. S. Camm, who only just managed to get his machine off. This month's competition will be decided Nov. 13th, the conditions being a complete circle to the right and left, after which the model flying the greatest distance in a straight line wins. At the Arts and Crafts Exhibition held at Wycombe, Mr. J. E. Starnes obtained first prize and diploma for his tractor monoplane. The glider has not yet been taken out, but the first windy day should see some air work.

CORRESPONDENCE.

The Theory of the Dunne Aeroplane.

[1804] In reply to Mr. Hume-Rothery's two letters in your recent issues, I must, in the first place, thank him for the nice things he has said about the lecture as a whole. But beyond this I am really indebted to him for having drawn the attention of your readers to the apparent difficulties surrounding this idea of "Reserve Tangential," for I fancy a good many people have failed to follow the original explanation. Indeed the same question was raised at the Aeronautical Society's discussion, which followed the lecture at a later date. My explanation was, I think, complete—no essential point was omitted, but I should perhaps have given greater prominence to certain of the introductory sentences, which sentences everyone seems to ignore. They ran thus:—

"Now supposing the machine to be climbing steeply or planing at too flat an angle so that it begins to lose speed and so to lose lift. It then begins to sink and, *ipso facto*, increases the angle of incidence."

This is the key of the matter. The machine in Fig. 14 is *sinking* from its previous path without change of attitude to the horizon. The angle of incidence is increased by this subsidence, and not by tilting the nose of the machine up. The phenomenon is analogous to that of ordinary soaring in a rising current, but is, of course, much more marked.

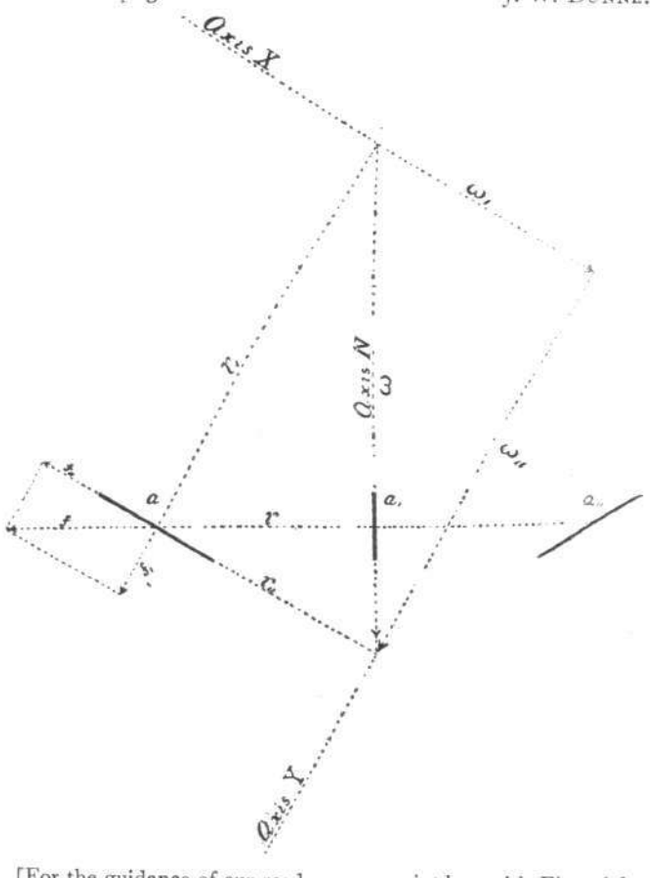
The base line in Figs. 12 and 14 is *any* convenient line (fixed with regard to the machine) to which the directions of the various forces may be referred. It may of course be so drawn that the normal to it will lie within the angle formed by the two extreme slopes of the air-pressure resultant. Then that component of the pressure-resultant which is parallel to the fixed reference line can be clearly exhibited to all as in the one case a propelling force and in the other a retarding force along that line, which line is integral with the machine. Of course if the angle of incidence were increased by cocking the machine up to a bigger angle to the horizon, then the fixed reference line would also be tilted up, and consequently the pressure vector would be tilted more backward with regard to the direction of gravity, so that there would be no gain. But Fig. 14 shows the machine at the moment it commences to sink, and before the ordinary stabilizing action has had time to dip the head for the glide down. The pressure vector has then become more forwardly inclined with regard to the direction of gravity than formerly. In other words, the machine is already commencing to plane down without having changed its attitude—though this change will occur in due course. The saving is one of time at a critical juncture in the negotiation of the phugoid.

There is of course no suggestion of any reserve of energy in Fig. 13, which shows the occurrence of the phenomenon while the motor is still in action, it will be noticed that each machine sinks the same perpendicular distance from its original path.

The main practical advantage obtained is that partial "stalling" is not followed by the usual sharp nose-dive or spiral-dive.

While on the subject of this lecture, will you allow me to warn your readers that Fig. 16 has been printed askew on the page, which must be rather confusing to some people. The "Axis N" should be upright.

J. W. DUNNE.



[For the guidance of our readers we reprint herewith Fig. 16 from page 969, in the correct position in which it should originally have appeared.—ED.]

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